National SAFETY NEWS

FEBRUARY 1957

This issue contains a special Technical Feature Section

The Journal

of the AMERICAN SOCIETY OF SAFETY ENGINEERS

FIRST AID IN THE FIELD

IN THIS ISSUE

Our States in Highway Safety
Muscles in a Machine Age
Standards — Tools for Mass Production and Safety

These People Save Lives

Scientists research constantly to improve or design new safety equipment . . .

Tool-makers, with experienced hands, skillfully produce the production tools . . .

Inspectors, sharp-eyed and trained, check every component and each assembly . . .

Workers mold, trim and assemble Skullgards that help turn accidents into incidents . . .

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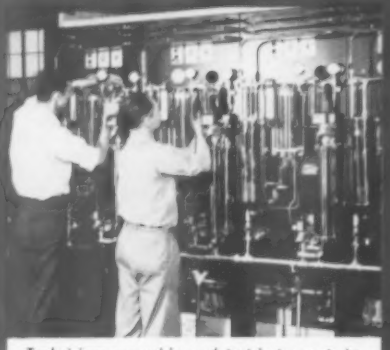

Technicians assemble and test instruments to detect explosive and toxic atmospheres . . .

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National
SAFETY NEWS
Published monthly by National Safety Council

Containing a special Technical Feature Section
The Journal of the
AMERICAN SOCIETY OF SAFETY ENGINEERS

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National Safety Council

Chartered by the Congress of the United States

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* * *

THE COVER: When men work at a distance from the dispensary, an approved first-aid kit may be a life saver. Here Truck Driver Al Smith and Safety Engineer Collin Frazier of Panhandle Eastern Pipe Line Company check the first aid kit on the truck. (Photo courtesy *Panhandle Lines.*)

* * *

Statements and opinions advanced in signed articles are personal expressions of the authors, not necessarily those of the National Safety Council.

* * *

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* * *

37,000 copies of this issue were printed.

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in ordinary footwear

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No. 1698 KANGAROO UPPER Oil-treated leather sole
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EDITORIAL

To Err Is Human

WHEN a man has made a serious mistake—perhaps one that has cost the company a lot of money—he needs plenty of moral support. Many a good man has been broken by the combined weight of self-reproach and the punishment inflicted by his associates and superiors. And many a man has regained his self-confidence because of an understanding boss—and often an understanding wife, too.

Competitive sport has furnished many examples and a misplay at Yankee Stadium or Ebbets Field gets a lot more attention than one on the job. Now, with TV and radio carrying the games to a vast army of unseen spectators, the athlete is more in the limelight than ever.

The late John J. McGraw was known throughout the baseball world as a tough guy. His opponents and his own men knew him as a fighter. But it wasn't cracking the whip alone that made the Giants of his day a great team.

McGraw didn't spare those who loafed on the job or broke training. He was rough on umpires, too. His temper was explosive and his vocabulary picturesque. But few men have displayed a better understanding of human fallibility.

Two misplays that have become classics in the history of sport robbed the Giants of victories that were within their grasp. Both were committed by stars. Merkle failed to touch second base in a crucial game and a pennant was lost. Snodgrass dropped an easy fly and a World's Series.

Hundreds of players have made errors and bonehead plays which were forgotten with yesterday's box scores. But Merkle and Snodgrass had the misfortune to err when the chips were down and fame and money were at stake.

Many a man has never seemed greater than in defeat. McGraw didn't wish two mistakes, costly as they were, to break two good men. He lost no time in renewing their contracts—at increased salaries. It was his way of showing his faith in them and restoring their self-confidence.

It might be argued that the gentle Connie Mack, who was equally understanding and never cussed an umpire or a player, had an even better record of pennants and World's Series victories. That merely proves what has been demonstrated so often in safety—that men of contrasting temperaments get results by different methods. And underneath differing exteriors these men have more in common than appears on the surface.

In safety, too, we are confronted with the problem of the person who has made a mistake causing property damage or personal injury. Punishment shouldn't be the only aim. The man responsible for a serious accident often needs rehabilitation as much as the victim.

NATIONAL SAFETY COUNCIL OFFICERS, 1956-57

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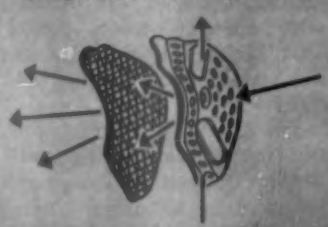

Diagram (left) shows how air is double-filtered for greater eye comfort and protection. Air passes through fine brass inner screen placed between side shields.

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Increased eye comfort in chipping and grinding work is provided by these new lightweight SELLSTROM Jumbo Goggles. Good cross ventilation plus new Double-Filter design makes this possible.

Thermosetting plastic eye cups are large enough to fit over most personal glasses with plenty of protection and no obstacle to vision. Two styles are similar except: No. 619 has adjustable nose bridge, while No. 621 has rigid brace bar so wearer can raise entire goggle with one hand (bar can be bent to provide exact adjustment). Supplied with Sellstrom clear hardened safety lenses, made to Federal Specifications.

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New X-weld Chain and New Master Link give added strength, safety!

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The Accoloy X-weld 125 chain is non-kinking. Each link has an oversize welded area with welds of full alloy strength. This means extra ruggedness and longer service life. Chain is identified at 5-foot intervals by tape markers reading "ACCO X-Weld Pat. No. 2763768." The new Shaped Section Master Link weighs no more, but it withstands deformation under loads up to 18% greater than a conventional round section can.

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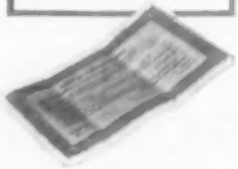

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Voice of the Reader

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The Diary

NEW YORK. "Excellent is a darn inadequate word to describe the December installment of the Diary of a Safety Engineer, "Two Years More Than Forever."

—R. A. McVETY, *Safety Director, Remington Rand*

Civil Defense

BATTLE CREEK, MICH. May we have permission to reprint and distribute the article, "Industry under Enemy Attack," in the October NEWS?

Articles such as this are valuable not only as stimulants to civil defense preparedness in industry but also provide important information and guidance in such planning. Copies are distributed with an appropriate letter to Civil Defense officials and certain industrial plants throughout the nation.

We are very grateful for the fine cooperation of the National Safety Council in disseminating information pertaining to our National Program for Industrial Survival. Mr. Howard Warzyn, a member of your editorial advisory staff, has been especially helpful.

—V. L. COUCH, *Director, Industry Office, National Headquarters, Federal Civil Defense Administration*

Christmas Cover

LANSING MICH. I just can't resist mentioning the beautiful cover on the December NEWS. It seems to catch the Christmas spirit just a little more than anything else I have seen. It gives me a feeling that relating the Christmas season to the magazine gives safety and the efforts of the Council a little personal warmth.

—NORMAN E. BORGERSON, *Deputy Superintendent, Michigan Dept. of Public Education*

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The secret of cable laid slings is in the construction of the wire rope. It is a combination of six individual wire ropes, not strands, laid around a special steel center. These ropes are coated with a special GALACCO coating for maximum corrosion resistance. And ACCO's patented DUALOC endings give extra strength and safety to the finished sling.

SAFEST SLINGS MADE. ACCO cable laid slings, like all of the other slings in ACCO's complete selection, are registered—incorporate extra safeguards, which make them the safest slings made.

Each individual component, made from the highest quality material suited to its use, is tested before assembly—must prove to have strength equal to or greater than the sling body. These components are then assembled into slings according to precisely-engineered designs which have proven their safety and reliability in extensive field tests.

Each completed sling is then proof-tested at twice the load-carrying capacity for which it is rated. Then, and only then, does it receive the coveted registration certificate and tag.

Get the details on Cable Laid, or any other ACCO *Registered* Wire Rope Slings, from your distributor—or call the nearest ACCO district branch below.

FREE FOLDER: Write the Wilkes-Barre office for your copy of new folder **DH-532** which gives details on ACCO *Registered* Cable-Laid Slings.

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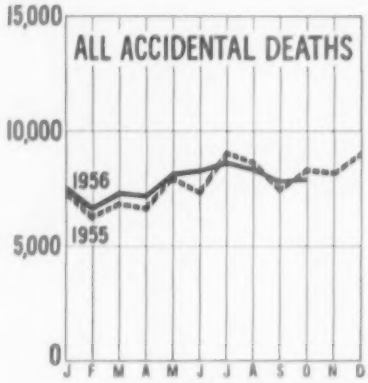
THE ACCIDENT BAROMETER

Prepared by the Statistics Division,

National Safety Council

ACCIDENTAL DEATHS in October totalled 7,900, a reduction of 400 from October, 1955. There were decreases in motor-vehicle and home, an increase in work and no change in public non-motor-vehicle deaths.

The total for 10 months was 77,200, or 2 per cent above 1955. Most of the increase occurred in motor-vehicle deaths but deaths from public non-motor-vehicle accidents also were up, while home and work accident fatalities numbered fewer than in 1955.



	1956	1955	Change
October	7,900	8,300	−5%
Ten Months	77,200	75,800	+2%

Motor-Vehicle Deaths

The October total of motor-vehicle deaths was 3,450, a decrease of 12 per cent from 3,918 in 1955.

Deaths for the 10 months totalled 32,420, an increase of 5 per cent over 1955. The 10-month death rate per 100,000,000 vehicle miles is not available at this time, but the nine-month rate was 6.1, 2 per cent above 1955.

Of the 45 states reporting for 10 months, 14 had fewer deaths than in 1955, 1 had the same number and 30 had more deaths. Reporting cities with populations of more than 10,000 had a reduction of 19 per cent for October but an increase of 2 per cent for the 10-month period.

Regional changes from 1955 in the 10-month motor-vehicle totals were:

North Atlantic	+ 3%
South Atlantic	+ 6%
North Central	+ 1%
South Central	+ 6%
Mountain	+10%
Pacific	+ 9%

Work Accidents

There were approximately 1,400 deaths from work accidents in October, or 100 more than in 1955. The 10-month death total was 11,600, down 2 per cent.

The October frequency rate per million man-hours in 18 sectional accident prevention contests conducted by the National Safety Council was 5.43, a reduction of 11 per cent from October, 1955. The October rate for plants in community council contests was 5.13, a decrease of 14 per cent. The 10-month rate in sectional contests was 5.59, down 4 per cent; in community council contests the rate was 5.64, up 3 per cent.

Public Deaths

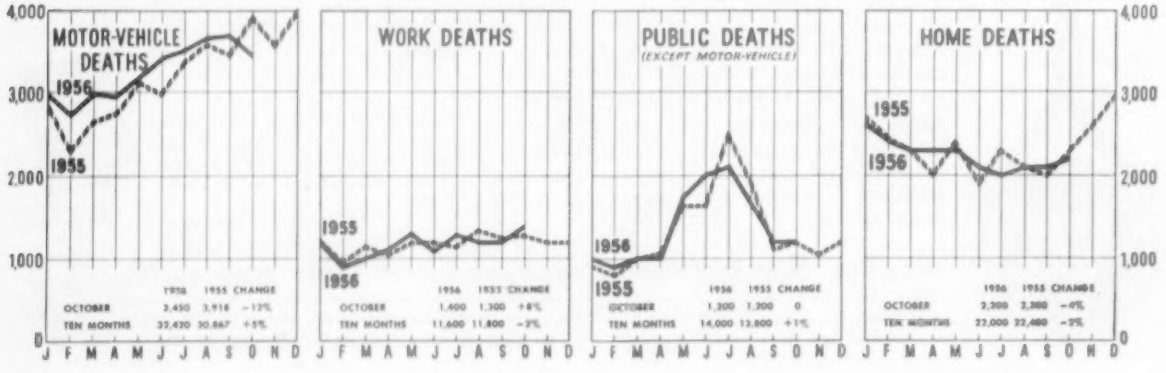
Deaths from public non-motor-vehicle accidents in October numbered 1,200, the same as in 1955.

The 10-month death total was 14,000, or 200 more than in 1955. There were increases in deaths from falls, firearms and transportation accidents, a decrease in drownings and no change in burns. Increases occurred in deaths of persons 65 years and over, and young people 15 to 24 and children under 5 years of age while other age groups showed decreases.

Home Deaths

October deaths from home accidents numbered approximately 2,200, or 4 per cent fewer than in October, 1955.

The January-October total was 22,000, a reduction of 2 per cent from 1955. Increases occurred in deaths from mechanical suffocation, burns and firearms accidents and decreases in fatal poisonings and falls. There were fewer deaths reported for young people 15 to 24 years of age and persons 45 years and over with increases in the other age groups.



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means more safety

MAGIC HEAVY-DUTY cleaning station for grimy, oily, areas where washing with a fluid is unavoidable, or where Anti-Fogging treatment is required. Use on plastics or any eyewear. MAGIC Cleaning and Anti-Fogging Fluid is combined in one can, *pressure-packed.* Touch the top and Presto! the can does the rest. 12 12-oz. cans per carton $12.50. About 1400 applications per can. Or, if you wish to use your own home made fluid, we can supply our adapter ($2.70) with a giant 16 oz. bottle and plunger complete. The Heavy-Duty Paper is our superb, super-strong, wet-strength sheet. Naturally, no scratching on plastic, and no lint. 18 big 760-sheet refills per carton at only $11.60. Indestructible steel Dispenser ($5.95) releases these interfolded sheets one-by-one, not in bunches, greatly reducing waste. Go Modern, Buy MAGIC. All prices F.O.B. shipping point. Order Now! Exchange all your other stations for Magic FREE. Wire or write us or your safety jobber today.

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THE SAFETY VALVE

Nothing human is alien to me

—TERENCE

Finding the Time

LIKE ME, you've probably wondered how some people can find the time and energy for association, club or church work or municipal politics and still have enough left to earn a living.

These jobs do take a lot of time. They also need a lot of physical endurance and an alert, well-organized mind. Often you'll find that the chap who has done such a swell job with the local safety council or ASSE chapter also has his bread-and-butter job well in hand. He also is good at delegating work, and probably has one of those charming, efficient secretaries who anticipates everything that has to be done—the kind you see in the movies.

One also needs moral support on the home front. A patient, sympathetic wife is a great help. And the boss must be an understanding guy who won't be looking at the clock when you're out setting up a meeting or late getting back from a luncheon.

Some people enjoy standing on their feet and talking. Some suffer acutely and wonder if the folks out front feel the same way. But they do it anyway for the good of the cause. Others get a kick out of making surveys and preparing reports.

Association work brings us in contact with men in our own line. We learn their problems; often they're just like ours. They may have the answers we're looking for. And once in a while somebody comes up with an idea that's worth its weight in uranium. We may even return to the job with a startlingly fresh point of view.

In this give-and-take of ideas and experience, older men can help younger, less experienced men. And youngsters often can teach us by the questions they ask.

But these contacts shouldn't be judged merely for the tangible ideas they produce. It they don't do anything else, they enable us to see some new faces, and get out of the routine for a brief breathing spell.

Some benefits may not be recognizable immediately. They may lodge in your subconscious mind and come to your help years later.

The Healing Art

IF YOU EVER FEEL a hankering for the leisurely pre-atomic pre-automobile days, just look at a collection of surgical and dental instruments they used in grandfather's day. They always remind me of the medieval torture tools in museums.

Early in the nineteenth century the only anesthetic for surgery and dentistry was a big slug of old sourmash. It wasn't a very effective pain killer but it did fog the patient and made him less difficult to handle.

And after undergoing the crude carving he was lucky if shock and infection didn't carry him off.

Many people are lucky enough to escape major surgery during their lifetime but it's a rare person who doesn't have to make at least one trip a year to the dentist for something more drastic than cleaning. And few judicial tortures have surpassed toothache and deep drilling. One of the compensations of age is that receding pulp makes the chompers less sensitive.

You don't have to be very old to remember some bad times in the dentist's chair. Twenty-five years ago anesthesia was seldom used except for extractions. Now the dentist sticks a needle in your gums and your jaw soon gets numb. If he's a good workman, you hardly feel the needle. You can relax while he reams out your molars with a power drill and assorted hand tools.

The dentist likes it, too. It's no fun working on a jumpy patient.

The fellow who discovered novocaine is one of the world's great benefactors.

* * *

Remember the week day to keep it holy.

ELBERT HUBBARD

* * *

The Cold War

RIGHT NOW, with much of this favored country in the grip of a cold wave, getting to and from the job is the hardest part of the day's work. And it means shoveling a few cubic feet of snow for some folks who are out of training.

Some medical joker was quoted by the press as saying that no person over 40 should shovel snow. If everybody in our block followed that advice there would still be deep drifts on the sidewalks.

But most of us commuters don't know what hardship really is—certainly not in comparison with those who keep things moving in spite of the weather. Trainmen and switchmen, transit employees, highway maintenance workers, and traffic officers have to turn out early and work late so we can get to work. They're out in the cold while we're in snug offices.

When weather is bad, they must allow extra time to reach their posts. If a bus driver is late reporting for duty, the schedule gets fouled up. If an editor strolls in late, few people know or care.

My hat's off to these heroes of the cold war. And that includes the kid who brings the morning paper.

Carman Fish

NOW...you can have the NEW LOOK* in ACETATE Safety Glasses, too!

Y-60

Y-61

* **New S-7 Bal-SAFE lens shape . . . for wider field of vision, better eye coverage, smarter appearance.**

Last year Bausch & Lomb introduced Titan, bringing the "new look" to quality safety eyewear. Titan is a combination metal-plastic frame of remarkable strength and outstanding appearance, winning instant worker acceptance.

Now comes an all-plastic companion frame. Y-60 (solid nose pads) and Y-61 (adjustable pads) are made from finest quality uniform texture sheet acetate. With the outstanding new S-7 lens shape... with exclusive strength features in bridge, temple and endpiece areas . . . you'll want Y-60 and Y-61 frames in all proper applications in your plant immediately.

For complete information, write today for Booklet A-1458. If you don't already have it, ask for the details on Titan, too: Booklet A-1423. Bausch & Lomb Optical Co., 90314 Smith St. Rochester 2, New York.

BAUSCH & LOMB

THE SAFETY LIBRARY

Books, pamphlets and periodicals of interest to safety men

Compiled by Ruth Parks, Librarian, NSC

BOOKS AND PAMPHLETS

Aeronautics

Human Problems in Jet Air Transportation. Ross A. McFarland. Reprint. 1956 SAE Transactions, p. 437-452. Society of Automotive Engineers, 29 W. 39th St., New York 18.

Chemicals

Lead Oxides. Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington, D. C. Chemical Safety Data Sheet SD-64, 1956, 10p. 30c.

Foundries

Foundry Air Pollution Control Manual. American Foundrymen's Society, Des Plaines, Ill. 1956, 58p. $4.25 to ASF members, $6.50 nonmembers.

Health

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WIRE FROM WASHINGTON

By Harry N. Rosenfield
Washington Counsel, National Safety Council

AT THE OPENING of the 85th session of Congress, Congressional committees submitted reports on highway, air, and marine safety. On the very first day Congress heard pleas for greater federal consideration for the safety of the American people.

Highways. The Roberts Special Subcommittee on Traffic Safety of the House Committee on Interstate and Foreign Commerce submitted a report on its hearings held last year (see "Wire," September 1956). The report presented a 19-point program of recommendations, including:

—More aggressive implementation of the Action Program of the President's Highway Safety Conference.
—Expanded basic research into the human factors contributing to traffic accidents.
—Expansion of school driver education and adult retraining programs.
—Strengthening of driver examination, licensing, and suspension procedures.
—Improvement of traffic law enforcement.
—Betterment of accident-reporting procedures and more effective use of accident data.
—Continued and expanded research on safe vehicle design "with less emphasis on speed and horsepower."
—Nation-wide standardization of traffic signs, signals, and markings.
—Increased university training in highway traffic administration, traffic management, and control.
—Closer and more effective coordination among groups working in traffic safety.
—Improved methods of public traffic safety education.
—Organized citizen support for public safety programs.
—Continued and expanded Congressional study of traffic safety.

At the very outset of its report, the Committee stated that "except for power brakes and the automobile safety belt, little has been done to prevent the unsuspecting consumer from killing himself and others as he whizzes along the highway at phenomenal speeds." It also complained of the lack of coordination and basic research and said: "This coordination, perhaps, could be supplied by one or more federal agencies . . . [The needed basic research] probably will be unnecessarily delayed unless some federal assistance is forthcoming."

The Congressional Committee said that it was not prepared to recommend any federal regulatory legislation dealing directly with traffic safety as had already been enacted, for example, for aviation. "But," it warned, "there is widespread demand for action. If the states and local communities continue to lag behind public sentiment in adopting safety measures, there unquestionably will be an increased demand for action by Congress."

In its detailed discussion of recommendations, the Committee's report makes frequent reference to the testimony and data provided by the National Safety Council, especially in connection with the need for more aggressive action supporting the Action Program and for expanded basic research.

"Highway traffic deaths and injuries," said the report, "are of a magnitude to be classed as a public health program," and the Committee thought of the United States Public Health Service as one logical agency to conduct the basic research, on the pattern of the legislation providing for research in air pollution. (See "Wire," August and September 1955.)

Unless states and local communities gave more attention to driver education and adult retraining, the Committee foresaw the need for federal action by assistance through federal vocational education grant-in-aid. Federal help was also mentioned as suitable in the area of better accident reporting.

It urged inclusion of "all known and tested safety devices, such as crash-padded paneling, padded windshield visor, dish-type steering wheel, safety glass, etc." as standard equipment on new cars, and commended installation and use of seat safety belts.

Industrial Safety. The U. S. Department of Labor issued its final figures on industrial accidents for 1955 and found that "despite slight increases in the injury rate for many industries, 1955 was one of the safest years for American industry." The all-manufacturing frequency rate for 1955 was 12.1, which is higher than the 1954 rate of 11.9, and 2 per cent above the all-time low established in 1954.

According to the report, most industry groups held their injury rates at about previous levels. In 15 groups, the change in the average injury-frequency rates amounted to 5 per cent or less. On the other hand, 10 individual industries (of the more than 200 covered in the report) showed increases of 25 per cent or more in their injury-frequency rates.

The Bureau of Mines issued interpretations on the Federal Coal Mine Safety Act of 1952 relating to its non-applicability to very small mines.

In a statement by the Atomic Energy Commission on the 10th

—*To page 105*

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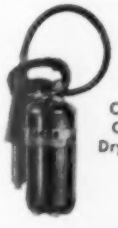

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AROUND THE COMPASS

ACTIVITIES • PROGRAMS • EVENTS

By George W. Harris

Field Service Department, NSC

Two New Councils In Washington State

Two local safety councils recently organized at Renton and Puyallup, Wash., make a total of four established in the state during 1956.

Nurses Study Home Safety

Thirty-five public health nurses of Racine and Racine County and the visiting nurses are participating in a new series of in-service training programs aimed at reducing home accidents.

The Racine County Safety Council is cooperating in the project.

Award Drivers Pass In Review

Twenty American Can Company drivers, representing 41 years of accident-free driving, passed in review recently at the San Francisco Canco plant, as a part of their Safe Driver Award ceremony.

Each driver maneuvered his eight-ton truck before assembled police; company, and San Francisco Chapter, National Safety Council officials. Upon receiving his award, each roared off to his morning driving assignment. The procession was led by 10 motorcycle policemen.

Omaha Studies Occupational Division Plan

The Omaha Safety Council *News* reports that a sub-committee of that organization is studying a proposal to change the Council's Industrial Committee to an Occupational Division. The purpose is to interest more people and organizations in its program, and also to offer fewer but better general interest meetings to which the community as a whole would be invited.

Los Angeles Chapter Moves to New Offices

After 18 years in the downtown area, the Greater Los Angeles Chapter, NSC has moved to its new location, 3388 West 8th Street.

The move culminated more than a year and a half of planning during which more than 50 possible sites were investigated by the building committee, composed of C. J. Weiss; Morgan Craft, and J. T. Blalock, chapter president.

The new quarters include private offices for the manager and division heads, a large general office, lounge, mailing room, machine equipment room, storage room and conference room.

Detroit Moves Damaged Cars

The Detroit Police Department has adopted the new policy of having drivers of cars damaged in accidents pull out of the way, if possible, to avoid congestion. Previously it was the rule that the vehicle would remain at the accident spot until police investigators arrived.

NSC FIELD REPRESENTATIVE John Hall combines business and pleasure on a recent visit to Arizona. After presenting an analysis of Tucson's report in the Annual Inventory of Traffic Safety Activities, he donned a Stetson hat and basked in sunlight from a can of "Tucson sunshine," gifts of the city's vice mayor. Attractive additions to the picture are shapely Tucson Sunshine Climate Club models Diana Herndon (left) and Sue Rowton.

CAR MODELS change from year to year, and more miles of super-highway are constructed. But the problems of accidents and congestion still challenge us.

Our Stake in Highway Safety

The petroleum industry's interest goes beyond full gas tanks. Participation in organized effort—especially at the local level—is needed to solve the traffic accident problem

By W. W. DAVISON

ANYONE who has ever ventured onto the highway behind the wheel of a car—and that means practically all of us—needs no reminder that the traffic problem is big, and important. But let us review just *how* big and *how* important it is to all of us.

Street and highway traffic in America is the sum of 50 million automobiles, 10 million trucks and a quarter of a million buses in motion on 3⅓ million miles of roads.

The daily movement of people and goods by this enormous, ever-increasing fleet of vehicles, public and private, makes motor transportation the largest single common activity in the American economy. In all its phases motor transportation is the nation's biggest business.

We all know that the motor vehicle has made the American economy the most highly developed in the world. We have seen it change the face of our land, remold our way of life and enrich our culture. It has enabled us to do more work and pursue pleasure more widely than any other people in history.

But the motor vehicle as a mass-mechanism is accident-prone. In the hands of 72 million Americans licensed to drive, the nation's automobiles, trucks, buses, and taxis are killing some 40,000 of us a year.

It would be visionary to say that all traffic deaths are prevent-

able, yet common observation and common sense tell us that most of them are preventable. We know that the rate of fatal traffic accidents can be reduced because it has been reduced.

In 1934, the nation-wide rate was more than 16 deaths for every 100 million miles traveled by motor vehicles. In 1955, the national rate was down to 6.4.

Yet the total of motor vehicle deaths in 1934 was 36,000, compared to 42,000 estimated for 1956. While the death *rate* has gone down sharply, highway slaughter increases because each year more cars travel more miles, at higher speeds, in greater traffic congestion.

The risks of accident exposure —and potential tragedy—increase each day. Unchecked, such a toll would mean that scarcely any individual in the United States could escape the tragedy of having one or more friend, relative, or associate killed or injured in a traffic accident.

This menace to life and limb makes street and highway safety one of the biggest—perhaps *the* biggest—challenges to economic and social action America must face.

Nearly 10 million Americans make their living directly or indirectly in the motor transport field. We are among them, producing and selling the fuel and other goods and services required by 61 million motor vehicles.

While it is our business to concentrate on our primary job of producing, refining, and selling gasoline and motor oil to keep this gigantic fleet rolling, I submit that we in the petroleum industry have a vital stake in keeping it rolling with maximum safety.

If the number and economic cost of traffic accidents can be reduced, it is certainly obvious that the motor transportation industry —including our particular branches of it—is going to be economically better off. All accidents cost money, and of all categories of accidents, motor accidents cost the largest sum of money, year after year—almost $5 billion a year. Anything that we do to cut down accident costs frees both public and private money to be spent constructively for better roads and better transportation.

The human aspects of the accident problem are, of course, of even more concern. All of us have had friends, relatives, and fellow workers killed or seriously injured in traffic. How few are the cases in which we did not shake our heads in the realization that the tragedy need not have happened—that a bit more caution and forethought, a trifle less speed, a gesture of courtesy, an extra measure of alertness on someone's part would have spared the tragedy.

No citizen can escape responsibility for taking part in the effort to cut down the needless human waste and economic cost of accidents. And I think those of us in the oil business can contribute a great deal to this effort.

You will ask how and in what specific way. To answer that question, I shall outline the program and purposes of the President's Highway Safety Conference.

The first of a series of conferences on highway safety called by the President of the United States was held in 1946 to find ways and means to stem the increase of traffic accidents that had appalled and bewildered the American public after the end of gasoline rationing. Two thousand delegates from the 48 states, including public officials and private citizens, developed an action program for applying all known effective accident prevention techniques. They recommended:

- That the administration, interpretation and enforcement of traffic laws be made uniform from state to state.
- Detailed traffic accident reports should be collected and analyzed on a nationally-organized basis for use in the guidance of highway safety activities.
- Expanding traffic safety education in the schools to prepare young people for safe driving and good citizenship on the highway. (Even today, only 11 states have top-level driving courses for high school students.)
- Courts, prosecutors, and police departments should be given properly selected and trained personnel, in adequate numbers, to enforce traffic laws and eliminate such practices as "ticket-fixing."
- Sound engineering principles should be utilized to make cars safer to operate and roads safer to drive on.
- Driver licensing procedures should be brought up to the highest possible standards, with emphasis on re-examination of drivers involved in accidents and in repeated violations of traffic laws.
- Public understanding and support for this program should be promoted aggressively.

These recommendations are the highlights of the first action program of the President's Conference. Over the years since 1946 the attack has been intensified.

In February 1954, President Eisenhower called a White House Conference on Highway Safety attended by leaders representing every segment of American life—government, industry, agriculture, labor, the press and so on. Several hundred businessmen delegates were among them. Their report reads in part:

- We can make the greatest contribution through organized action in our communities and states.
- As businessmen we can best respond to the President's appeal by giving our active support to the development and effective operation of state and local traffic safety organizations.
- State and community safety

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W. W. DAVISON is Vice-President, Standard Oil Company of California. This article is adapted from an address at the San Joaquin Valley Oil Industry Safety Conference, Bakersfield, Calif., October 9-10, 1956.

LOCAL law enforcement officials are eager to cooperate in accident prevention. Collin Frazier discusses an auto accident with Police Chief Ralph Smith, of Liberal, Kan., and Highway Patrolmen Harold Williams, left, and Norman Anderson.

Man On the Go

It takes a lot of know-how and many miles of travel to carry on the safety program of a natural gas pipe line company

A SAFETY ENGINEER in the natural gas transmission industry covers a lot of territory in the course of his work and meets a variety of safety problems in the fields, along pipe lines, and on highways.

To give employees of Panhandle Eastern Pipe Line Company a better appreciation of the safety engineering staff's contribution to their protection, *Panhandle Lines*, published monthly at the company's operating headquarters in Kansas City, Mo., recently carried a feature story which included the accompanying scenes in the busy life of a safety engineer.

Collin Frazier, whose activities are shown in the story, is safety engineer for the company's gathering area in the gas fields of Texas, Oklahoma and Kansas. His territory extends as far east as the Greensburg station.

PANHANDLE safety engineers attend schools periodically to study new techniques and equipment. J. S. Parkinson, Everett Myers, and Collin Frazier examine extinguisher equipment at a fire school at Marinette, Wis.

NEW EQUIPMENT is inspected for possible hazards. Here Mr. Frazier examines a compressed air dust clean-up tool designed by Lawrence McAnarney, right.

FIRE PROTECTION. Mr. Frazier weighs a carbon dioxide cartridge for a dry powder extinguisher. An underweight cartridge could cause the extinguisher to fail.

Panhandle's safety program operates on the sound principle that there is a cause for every accident. Safety engineers try to anticipate and correct these causes before accidents result.

To reach this goal, the safety engineer performs many tasks. He inspects constantly for hazards, publicizes safety throughout his territory, arranges and conducts safety meetings, promotes sale of safety shoes, investigates accidents, supervises first aid and fire protection—to name but a few of his activities.

Since many company cars and trucks are on the highways, traffic safety ranks high among his interests. He confers frequently with local law-enforcement officials.

The safety engineer is not a policeman. His job is not to make rules and then enforce them. Rather, he acts as advisor and teacher, suggesting ways of avoiding accidents and recommending different equipment or safer methods of doing a specific job.

The safety engineer works closely with supervisors. Often he learns of hazards and possible

ABOVE: Defective tools are accident makers. Mr. Frazier and Plant Superintendent "Army" Ormiston inspect a toolboard. Tools found damaged are repaired or replaced.

LEFT: Handling heavy equipment calls for foot protection. Mr. Frazier demonstrates a new line of steel-toed shoes.

A CAMERA is used in accident investigation. Here Frazier photographs a company car damaged in a collision. The photo is attached to the report which will be reviewed by the Accident Prevention Committee and will assist the Transportation and Legal Departments in determining whether a claim for damages will be made.

remedies through an informal chat over a Coke. He invites discussion of specific safety problems in get-it-off-your-chest sessions at a warehouse or compressor station.

Inevitably, it seems, an occasional accident does occur despite efforts of everyone concerned. That means a detailed investigation and report by the safety engineer. He talks with persons likely to know something about the accident's causes. From various sources he finds out the who, what, when and where. From this he determines the why and how—*why* the accident occurred and *how* recurrence can be prevented.

Accident prevention is a never-ending job. In this mechanized age, new methods and equipment bring new operating problems and hazards, so the safety engineer must keep informed of progress in industry by reading current literature and attending schools where he learns up-to-date safety and fire-protection techniques.

The safety engineer keeps a sharp eye on the record of each unit in Panhandle's safety-award contest. When a unit in his territory completes 365 consecutive days without a chargeable accident it is awarded a bronze plaque at a "victory dinner." The safety engineer attends, presents the award and gives a brief congratulatory speech.

Of his many tasks, that is the most enjoyable.

Now for a trip with Collin Frazier around his territory.

COMPANY VEHICLES must be kept in good working order since they are driven some eight million miles each year. Safety checks on cars and trucks are made weekly by the driver and every three months by the safety engineer.

SIGHT SCREENING involves a series of tests to determine possible basic visual skills and deficiencies. Field employees are given the test once each year. Here Aurel Kinney, meter engineer, takes test as Frazier checks results.

(Fiction)

THE DIARY OF A SAFETY ENGINEER

Called in too late to make suggestions on plant layout, our safety engineer begins his new job on a note of suspicion

The New Assignment

By BILL ANDREWS

February 1, 1957

There is, I think, much to be said for the typical midwestern landscape, but not on the first of February! The flat, black fields streaked with thawing snow, the dull colorlessness of the slight rise to the east, and the leafless mat of trees lining Salt Creek to the west have little to recommend them.

Put yellow corn on that flat, some Jersey cows on the grassy hillside, and a mass of silver and green on the riverside trees, and there is beauty—but not on February 1, and most especially not in the midst of an industrial building project, when the cats and the drag lines have begun ripping up the rich prairie soil.

The assistant construction superintendent and I made the grand tour of Lovellburg in a jeep, ploughing through mudholes, splashing through puddles, spinning wheels on occasional ice patches as I tried to reconstruct mentally the neat town and plant layout now marked only by a few scars on the soil and a profusion of surveyor's stakes pounded into the ground.

Only these, and, in flat contrast to the emptiness, one complete, modern factory building with a neat, gravelled drive free of snow, smoke from the chimney, and a cluster of perhaps 20 quite new homes on two blocks of paved streets.

At the other end of the project, perhaps a mile from the plant and homes, was a mass of parked dirt-moving equipment, some construction shanties, and a two-story frame barrack building reminiscent of any wartime Army camp.

The assistant superintendent was a good guide, and in a couple of hours I had a fairly good mental picture of what Lovellburg would look like. We drove back to the completed plant, and went into the construction office, which was separated from the plant office by a temporary partition.

I knew the general situation. McCarthy Products had built the small plant on the prairie to produce their line of electronic instruments. The homes had been built for the nucleus of a plant force that they brought with them from Chicago. They banked on being able to recruit and train local labor in this depressed agricultural area and from the watch factory that had supported Greentown, 10 miles away, until it closed in '51.

The experiment worked both well and badly. The factory hands from Greentown were adaptable and trainable. But except for a few girls, the farm folk recruited by McCarthy did not adapt well to the light assembly operations. Then, amazingly, the watch factory got new capital, and McCarthy could hold less than half of its retrained watchmakers.

At this point, Eastern Enterprises stepped in, bought a substantial share in McCarthy Products, and proceeded to plan for the area the development that would become Lovellburg—an electric appliance plant, an aircraft components factory, a chemical operation, a housing development of 3,000 homes, complete with shopping and recreation facilities, schools, churches, a railroad spur, and access roads.

In this complex, the McCarthy plant would continue to operate, and the expectation was that the creation of a complete city on the prairie would reattract the lost watch makers from the old slightly shabby housing of Greentown's elm-shaded streets.

And it's all in my lap, safety-wise.

In the assistant superintendent's office I had before me the blueprints, the industrial engineers' reports on the flow of materials, and the completion schedules of the construction work.

Obviously some things had to come first. First priority, it seems to me, lies in something given little consideration to date—the flow of people from the housing

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Industrial Standards

Tools for mass production and safety

By CYRIL AINSWORTH

Standards are the consensus of what is right, of what is most effective. They are as important in safety as in any other industrial operation

AT FIRST it may seem presumptuous to say that industrial safety and standardization mean the same. Of course, such a statement cannot be supported in its full implication. It is true, however, that without standardization, industrial safety cannot reach its full effectiveness.

These two activities came to be bosom companions this way: Industrial accident prevention existed years before the National Safety Council. Many industrial firms, shocked by deaths and injuries in their plants, instituted accident-prevention programs.

For years, plants seldom communicated among themselves. But the need for communication became evident and finally expressed itself in formation of the National Safety Council. While standardization was not mentioned, this desire for an avenue of communication, for an avenue for exchange of views, for a means through which solutions to common problems could be developed, was in effect an expression of a need for standards.

Accident prevention, however, predates these activities. Its beginning is found in the early factory-inspection legislation passed by several states, Massachusetts leading the way in the early 1890s.

Though not fully recognized, standardization was the underlying theme of this early activity. Standardization had been practiced at the company and industry-wide level as a mass-production tool for many years, but its significance in accident prevention was not recognized until 1919, a few years after birth of the National Safety Council.

In 1918 the Council conducted a national survey of state legislation—rules and regulations (sometimes mandatory, usually recommendatory) promulgated by municipal, state and federal agencies, insurance companies, accident-prevention committees of trade associations and other groups, and surveyed the preachments and practices of companies and individuals.

Without Standards . . . Chaos

The National Safety movement was only a little more than four years old. Before organization of the Council, associations, companies and individuals had worked at accident prevention virtually single-handedly. The survey showed complete chaos. It was clear something had to be done quickly or many persons would try to prevent accidents with methods that had no prevention in them. Contradiction pervaded the picture, and the National Safety Council saw clearly that unification of methods and practices was needed.

The Council believed that while it could function effectively in a leadership capacity and publicize results of the survey, it was not organized to conduct a program of standardization of proportions indicated. It consulted the National Bureau of Standards, which agreed to call a conference to discuss establishment of procedures for standardizing safety practices. About the same time that the National Safety Council completed its survey, the American Standards Association (then known as the American Engineering Standards Committee) came into existence.

It was less than a year old when the aforementioned national conference was convened. It was decided to study the suitability of standardization procedures of the ASA for use in accident prevention. This resulted in an invitation to the ASA to reorganize its membership and use its procedures for standardization in the field of industrial safety. The invitation was accepted.

National industrial safety and national standardization in their broadest application started from a recognized need for uniform approaches to common problems. This is the history of the companionship of industrial safety and standardization.

Pioneers in the Field

Before continuing, let's express appreciation for the leadership of the National Safety Council in launching the standardization phase of accident prevention. This leadership came not only through the nation-wide survey mentioned previously. It continued through the formative years of the program under ASA auspices, with the Council, through such representatives as Albert Whitney, Walter Paine, Gene Pettibone, George Sanford, Lewis De Blois,

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David Van Schaack, David S. Beyer and C. B. Auel, guiding the program and promoting its significance and importance.

The counsel and leadership of the late Sidney Williams was an outstanding factor in establishing the program on a sound basis. When he went into highway safety, Dean Keefer continued leadership through supervision of staff operations.

The National Safety Council survey showed that the greatest need for standardization centered in regulations of state regulatory bodies. The need was greatest because the regulations had the effect of law and undoubtedly some industries were being forced legally to do things through technically unsound methods.

Ungrounded Fears

While uniformity was important to companies operating in several states, the principal need centered in the building of technically sound regulations. The great emphasis, therefore, was placed on formulated safety codes in a regulatory format through the cooperative efforts of state and federal agencies, employers, employees, insurance companies, manufacturers of equipment and technical experts.

Work was slow at first. Each group tried to protect its own interests and educational effort had to be put into the program to develop an understanding of the mutual benefits to be obtained.

At first industry feared the industrial safety standardization program would stimulate promulgation of rules and regulations by regulatory bodies. It found that through the program it had an opportunity to write its own ticket as to what would be enforced against it, provided it did an intelligent job.

Labor was afraid that its influence with state agencies would be watered down. It found, however, that its position was stronger. Now it had a specific group of technical requirements to propose. Further, it could point to agreement with industry.

The governmental agency was somewhat afraid that it might be giving up its rights in the formulation of regulations. It found that all its rights and prerogatives were maintained, and that its enforcement of regulations based on American Safety Standards was made easier because of previous acceptance by industry and labor.

Equipment manufacturers feared upsetting production programs and competition. They found that problems in production caused by differences in state requirements largely levelled out. They were able to make larger runs at lower unit cost. Furthermore, the competitive situation was improved, in that the intelligent manufacturer had new quality sales arguments to present customers. These values, as well as those which other participating groups obtained, have become more and more recognized as the years have gone by.

Has the program been successful? Undoubtedly. Total uniformity among the 48 states has not been obtained and probably never will be. Increasingly, state regulatory bodies inquire about and study American Safety Standards before proceeding with drafting work of their own. Recent surveys show an improvement in technical competency of legal rules and regulations over the situation that existed in 1920, when national work got under way. Credit goes to improved methods of state agencies, increasing competence of regulatory officials and constructive assistance given by industry and labor. The prestige of standards approved as American Standard, however, has had a marked effect on this situation.

Has the program had any shortcomings? Definitely yes. These are in two areas—limited use of

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You're Radiant Today

A scientist recently announced that humans, plants and animals are continually swapping atoms. That there is a rapid atomic turnover in living things.

Some of the atoms we're exposed to may have been cast off by a dinosaur—or a snapdragon. Others flitting into and out of our tissues may have been exhaled by Julius Caesar—or Cleopatra.

This type of carryings-on sort of makes you wonder. Could this atomic interchange be responsible for some of the impulses we have, or acts we perform?

For example, I've been feeling quite tigerish lately. But, can I brag on myself, or is it just because I come by the zoo on my way to work? The other night I went home determined to show my wife who was really the boss. Then, as we came face to face, my determination faded. Now, I wonder if it was that new negligee she was wearing—or the bowl of fresh pansies on the bureau—that knifed me in the back.

Maybe the kids will get sprayed with a bullish lot of these transients someday and try to turn Pop over a knee. Or, the pup gets caught in the "fall-out" from an obstreperous beast and starts trying to throw his weight around.

Although such things may be interesting to contemplate, I'm afraid folks would look down their noses at you if you pulled some such excuse for getting into trouble.

Our attitude toward life radiates in a similar way, though, and affects everyone around us. If we have a devil-may-care attitude toward things in general it will be reflected in the children, the wife, friends, and others we contact. The way we drive on the road, the chances we take on the job, the way we act at home may have detrimental effects on others.

They say we're judged by the company we keep. Maybe someday we'll be judged by the types of atoms we emit. In the meantime, whether you're radiating by atoms or acts, try to make them the safest kind possible, eh?

—Robert D. Gidel

HUMAN ARMS AND BACKS are still the most widely used equipment for handling material in some parts of the world. Accident statistics for these operations are not available.

Muscles in a Machine Age

Manual handling takes more than a strong back. Careful job assignment, training and supervision, and the right tools and equipment will make the work safer and easier

MECHANICAL EQUIPMENT for handling materials has made modern industry possible. Cranes, conveyors, fork trucks and other heavy-duty devices keep the material moving through the various stages of manufacture and distribution, speeding up the processes and removing opportunities for personal injury.

But human muscles aren't yet obsolete in industry. There are still operations where loads are relatively light and the volume does not justify a large investment in mechanical equipment. Yet even under these conditions a study of processes and material flow might indicate the value of at least the simpler handling devices.

The manual phase of a materials-handling program should include four major points:

1. Selection of employees.
2. Teaching know-how.
3. Supervision.
4. Use of tools and aids, plant layout.

1. Picking the men. When a truck, hoist or crane is bought, the experienced buyer makes sure it has ample capacity for the job. Unfortunately, the same care is not always used in assigning employees to their jobs.

Handling materials by hand is often regarded as unskilled labor, so men are assigned to it because they can't be used for jobs requiring greater skills. Too, when an extra man is needed to move rush-order material, he will be a man who can be spared from another job. Perhaps he hasn't been taught to lift correctly or there are some defects in his anatomy which can't stand unusual strain. Industry is paying for a lot of lame backs resulting from such neglect.

Pre-employment examinations, conducted carefully by a physician familiar with the plant's needs, will prevent many a man being assigned to a job beyond his capacity. A man with a predispo-

sition toward hernia, for example, should not be placed on any job involving physical strain.

Men shouldn't be selected on appearance alone. Some small, wiry men can handle heavier loads than many taller, heavier men. The husky-looking fellow may be suffering a heart condition, high blood pressure, poor vision or other ailment that might affect his ability to do certain work. Only a medical examination will reveal these defects.

In many cases, these persons can be restored to reasonably sound physical condition through medical treatment, although their job assignments still should be carefully watched.

While details of these physical examinations should remain confidential between doctor and patient, foremen should be informed of a worker's physical limitations and instructed to avoid using him on jobs that might aggravate existing disability.

An employee's temperament should be considered, too. A fast-moving person—one whose physical movements are quicker than his mental processes—may endanger both himself and other members of his team. The plant Sampson who prides himself on his physical strength should be restrained tactfully.

2. Teaching know-how. There is a definite knack to lifting and carrying. It is seldom instinctive; it must be taught.

Numerous posters and employee manuals illustrate the correct method of lifting. The untrained person will usually bend from the waist, using back muscles to lift the load. The experienced man crouches as close to the load as possible with his legs bent at about a 90-degree angle at the knees; his back as straight as possible. In the proper position, leg muscles are in tension, ready to do the work. Back muscles are locked so that the back is held rigid. To lift the object, he straightens his legs, at the same time swinging his back to a vertical position.

When the object must be carried to another point, the worker should first inspect the ground around the object and the route over which it is to be carried, making sure there are no slippery spots or obstructions which might cause a fall.

He also should inspect the object to decide how to grasp it and how to avoid sharp edges and slivers. If the object is slippery from dampness or grease, he should wipe it dry.

The training program will be governed, of course, by size and resources of the company. The small plant which cannot afford a training director and elaborate program can still do much with facilities at hand.

CHECK LIST FOR MANUAL HANDLING

		Yes	No
1.	Do all employees know how to lift properly?	☐	☐
2.	Are gloves, goggles, aprons, safety shoes and other personal protective equipment furnished?	☐	☐
3.	Is flooring safe for loads and in good condition?	☐	☐
4.	Are aisles and ramps OK?	☐	☐
5.	Is lighting adequate?	☐	☐
6.	Are materials piled properly?	☐	☐
7.	Are tools and accessories used for handling in good condition?	☐	☐
8.	Are storage racks and other facilities sufficient and safe?	☐	☐
9.	Are bridge plates in good condition? Do they set securely? Are they non-slip? Are edges turned up? Do they have hand holds for carrying?	☐	☐

ROBOTS of varied design have been used for teaching correct methods of lifting. This one registers the comparative strain on back and leg muscles in right and wrong methods of lifting.

In many companies the training must be done by foremen and supervisors. These men are held responsible for good work and for safety, and even where there is a well-organized training setup, a foreman still must teach his men many of the fine points of their jobs.

Not all foremen, however, are born teachers. They must know their stuff to begin with, and beyond that they must be able to get this knowledge across to their men. Many foremen have been developed into reasonably good teachers through courses conducted by the company or by groups of companies working through some organization such as a local safety council.

Printed material on a variety of topics can be obtained from the National Safety Council, from insurance companies and from state departments. These may be used in plant safety meetings as well as in more formal training classes.

3. Supervision. Training men in correct methods isn't enough. They must be observed on the job to make sure they are following the methods they have been taught and haven't lapsed into unsafe ways. The foreman needs the support and encouragement of management if he is to retain the respect and confidence of his men. In summary, the important parts of a foreman's job are to:

—See that each man working under him knows how to do his job ac-

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Lenses from Plastics

By L. D. BRONSON, O.D.

Developments in hard resin plastics have produced protective lenses of high ophthalmic quality

PERSONAL experiences in research and in private practice, involving developments in hard resin plastics, have given the writer the greatest confidence in the future acceptance of hard resin lens in eye protection for the young, the industrial worker, and other eye glass wearers.

Glass is one of the hardest materials in existence. Hardened steel, carboloy, diamond, or highly abrading material are required to leave impressions on glass. Yet, the constant rubbing of eye lashes against the ocular surface of a lens will mar it. With ordinary use and care a hard resin plastic lens will outlast the interval between prescriptions.

More than 10 years ago I was engaged in war work particularly concerned with lenses for gas masks. At that time the wearing of gas masks presented certain problems. Soldiers who wore corrective lenses discovered that these would fog when their masks were in place. This condition made clear vision difficult. The men invariably sought relief by discarding the gas mask. In actual chemical warfare this would have proved disastrous.

Anti-fogging lotions proved unsatisfactory. Further investigation revealed that transparent plastic, such as methyl methacrylate (acrylic group), would respond more readily to temperature changes than glass, thus minimizing condensation and fogging. All plastic is known to possess low thermal conductivity. Attempts to surface-grind a thermoplastic (lucite) to a focus resulted only in a surface unfit for spectacle lens use.

Within the past few years great strides have been made in transparent plastics. About four years ago I became interested in a form of plastic known as a monomer whose basic characteristics approximate the most desirable specifications for a fine ophthalmic lens. The original developmental work on this material demanded an extensive survey and investigation into the vast realm of the chemistry of organic resins.

In the chemistry of resins, organic plastics are classified in two major groups — thermoplastic and thermosetting plastics.

A truly thermoplastic material softens when subjected to temperature increases until it becomes so pliable that it can be stretched and molded into complex shapes without appreciable change in chemical structure. When cooled a thermoplastic hardens and shrinks.

This hardening and softening cycle may be repeated indefinitely without decomposition or deterioration of the plastic material. In this group are found the acrylics (plexiglas and lucite), cellulose acetate, cellulose nitrate (zylonite), polystyrene, vinyl, etc.

The second group are the thermosetting plastics which first soften when heated, then harden. This transformation from a liquid into a solid is known as polymerization. The great achievements in the field of plastics can be claimed by this latter chemical device. The relationship between the time and temperature required in the hardening process is known as the curing cycle.

The chemical action in this second group is irreversible, and is the distinguishing difference in its relationship to the thermoplastic group. If the temperature is increased sufficiently (above 300 F.), the thermosetting material decomposes without melting and without substantial softening. Members of this group are known as the melamines, phenolics, ureas, polyesters, allyls, etc.

Thermoplastic Materials

Thermoplastics lend themselves readily to severe forming operations, with the application of a variance of pressure and temperature elevation. Thermosetting plastics, on the other hand, are preferred where dimensional stability and heat resistance are imperative.

The term "plastic" covers a multitude of materials. We think of a plastic substance as something that can be shaped or

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molded perhaps with the aid of heat or pressure or both. In general that is correct. This synthetic solid material can be used for innumerable optical purposes. Various types of plastics have different characteristics. Each requires individual consideration; however, a few generalizations can be made.

Plastic components are supplied by the manufacturer in two principal forms — in either pellets, granules, powder, or in sheet stock, in which chemical formulation has been compounded previously and made available for molding or cutting and shaping. The manufacturer of the compound provides data relating to the application of heat and pressure.

Monomers. The second principal form is as a monomer, a basic chemical compound to which may be added plasticizers, fillers, dyes, binders, modifiers, or other monomers and finally a catalyst or activator. In this instance the fabricator will custom design his plastic to suit all his requirements. The curing cycle is then determined by experimentation.

When two monomers are combined and then polymerized, the polymer thus obtained will differ in molecular structure from the unmixed monomers. These are called copolymers. The latter method is a common procedure in the chemistry of plastics.

The principal thermoplastic resins investigated for use as spectacle lenses are the acrylics (methyl methacrylate or lucite and plexiglas), cellulose nitrate, cellulose acetate, polystyrene and vinyl.

The acrylics have been recognized throughout the plastic industry as the finest example of a colorless, rigid, and highly transparent material with a surface hardness which places them high among the plastics to be formed into ophthalmic lenses. They possess the greatest resistance to sunlight and weathering. They are chemically inert, stable and nontoxic. They are flexible and shatter-resistant.

The smoothness of surface and clarity of the cast material are superior to those of drawn silica glass. Although they are harder than most transparent plastics, nevertheless, they have poor scratch resistance and poor impact resistance. In this latter regard they are still superior to glass.

Cellulose nitrate (zylonite) is produced by nitration of cotton linters and wood pulp. This plastic is commonly called celluloid. It can be polished to a high lustre, is very sensitive to exposure to heat or ultraviolet radiation, and discolors rapidly and becomes brittle. It is highly flammable. These characteristics make it unfit for ophthalmic lenses.

Cellulose acetate is also made from cotton linters and wood pulp but purified with acetic acid and acetic anhydride. It is easily molded by the injection method into lenses with smooth surfaces depending upon the fineness of workmanship employed in the preparation of the mold cavity.

Caution must be exercised in the molding operation to avoid flow marks, crazing, and hazing. This material softens at the relatively low temperature of 150 F. It is nonflammable. Hardness, toughness, color, and other properties vary, depending upon the plasticizers, dyes and pigments used in their conversion. This plastic lacked the essential requirements for a practical lens.

Polystyrene, the polymer of styrene, consists of saturated hydrocarbon molecules in which one of every four hydrogens is substituted by a phenyl group. It is comparatively new as a commercial plastic, and is substantially hard and rigid, colorless, and quite transparent. Polystyrene does not soften until it approaches 200 F. These properties, combined with chemical inertness, make it a choice plastic.

The fact that it is readily attacked by most organic solvents such as acetone, limits its usefulness for ophthalmic lens work. Nevertheless, it has been employed extensively for scientific lens elements.

During World War II our government realized that we were not geared to mass produce precision glass lens elements for gunsights, rangefinders, aerial cameras, and a host of other military instruments. The government contracted, under N. D. R. C. with a number of scientific groups, to conduct research in the use of

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the LIGHTER SIDE
NATIONAL SAFETY COUNCIL
SAY, AREN'T YOU THE GAL WHO SAID YOU DIDN'T LOOK GOOD IN GOGGLES?
THIS IS JUST TO SHOW THE BOND HOLDERS HOW THE FINISHED TUNNEL WILL LOOK
HERB, WHO'RE YOU SMOKING IN BED?
FURNITURE FACTORY

Portable Shower Protects Against Missile Fuel Spills

THE EMPHASIS in the Army on tactical guided missile operations pointed to a need for safety equipment to meet the hazards of "on location" fueling under tactical conditions of large quantities of toxic propellants. One piece of equipment required was a high-capacity deluge water shower unit for neutralizing liquid propellant spills on personnel.

Other requirements were portability, light weight, and simplicity of operation and maintenance. A self-contained shower unit incorporating these requirements was developed at the Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va.

Application for a patent has been made by John F. Christian of the Laboratories staff who developed the unit.

The shower consists of an insulated 100-gal. water tank, a pressure regulator, two standard 200 cu. ft. compressed gas cylinders, a treadle-operated discharge valve, a deluge shower head and a heating unit, all mounted on a skid.

The tank is pressurized to 50 psi. by water pumped air from one of the gas cylinders reduced in pressure by the regulator. One cylinder is a spare to be used while the other is being refilled. Other water-pumped gases, such as nitrogen, which use the same standard cylinder valve connection may be substituted for air.

The shower is actuated by the user standing on the treadle, which is connected to a lever-operated discharge valve. Air pressure will force the water through the deluge shower head centered above the treadle at rates up to approximately 100 gpm. The discharge valve is a spring-loaded plate type with the valve seat located within the wall of the tank to prevent water from freezing around the valve. A small drain on the discharge side of the valve seat drains any residual water from the shower pipe and valve.

A basic heating unit keeps water from freezing when ambient temperatures are as low as minus 25 F. There are four kerosene-fueled truck flares centered beneath four vertical flues in the tank. The flares can maintain the water at 150 F. when the outside temperature is —25 F. A thermometer indicating the water temperature is mounted on the side of the tank. To keep the water from becoming uncomfortably hot, inspections of the thermometer must be made every few hours and then the number of flares burning varied to control heat.

An electric immersion heater is available for hazardous areas where an open flame is prohibited, such as propellant storage dumps. The 3-phase, 2-5-kw immersion heater has an explosion-proof junction box and is screwed into a special boss on the side of the tank. It has an integral thermostatic control.

An eye wash fountain is available as an accessory. The two impinging streams of the fountain will accommodate the shortest GI with the closest set eyes as well as the tallest GI with the widest spaced eyes.

Safety was incorporated in the design at every step. The flares, as a heat producing element, are tucked well within the confines of the skid to prevent accidental contact with them. Yet by reaching through large holes in the skid side members the flares can be easily removed. There is a fusible core in the drain plug which to allow overheated water to drain out and thus deactivate the shower. Spare drain plugs are supplied so the shower can be promptly put back in service.

BEFORE: Lineman uses 40-ft. extension ladder to make adjustments on control panel for pole-top regulator installation. Ladder often jutted into traffic lanes and maintenance costs were high.

AFTER: Adopting employee's suggestion, control panel was lowered and platform ladder replaced extension ladder. Workman now performs task off the highway, no longer needs rubber protective equipment.

DOWN TO EARTH

This job used to involve high climbing, working around hot wires, and traffic hazards. The new method is safer and quicker

A DANGEROUS and costly job of the Long Island Lighting Company has been discontinued—and an improved method used in its stead—as the result of a suggestion by a substation maintenance section employee.

In the past, it was accepted routine that control panels for pole-top regulators be mounted on the regulator itself. Such installations were made on poles ranging in height from 30 to 45 ft.

Maintenance of this type installation was found to be both dangerous and costly — dangerous in that 40-ft. extension ladders in many cases jutted into traffic lanes; and costly in that preparation needed for maintaining such an installation was resulting in high man-hour requirements.

But the employee suggestion ended all that. After the suggestion was evaluated, officials decided to lower the control panel of the pole-top regulator to a more accessible place on the pole—10 ft. above the ground on the same side as the regulator.

Flexible seal-tight conduit was used from the top of the regulator to the galvanized conduit and fastened with water-tight fittings.

The lengthy extension ladder was replaced with a platform ladder and previously essential rubber protective equipment was discarded. Work can now be performed in a safer spot off the pavement.

Employee participation in the Long Island Lighting Company's safety program has long been an integral part of the firm's goal of promoting safe work practices and attitudes.

MARINE fire fighting trainees learn the use of Navy oxygen breathing apparatus.

On the Alert

Realistic drills keep fire fighters in constant readiness at this naval ammunition depot

By WILLIAM CUTHBERT

FOR THE SIXTH consecutive day the thermometer climbed to almost 100. Suddenly, at 1255, the blast of the fire alarm caused all ears to perk to attention.

"One - two - three - four - five - six," throughout the Naval Ammunition Depot at Philadelphia's Fort Mifflin some counted aloud, others noted the blasts mentally.

After a brief interval, there was a single blast which completed the two-signal alarm, the first number indicating the district and the second noting the box number from which the alarm was sounded.

"Sixty-one," could be heard around the Depot.

In the offices and production buildings the posted fire alarm cards were glanced at quickly. Outside the buildings many wallet-sized cards were given a hasty look. A few employees, from memory, visualized the district and box.

A chorus of voices echoed, "Building 195, the Central Heating Plant," as the sound of a fire engine merged with the repeated signal.

A fire alarm under any condition is a sinister thing, and where explosives are involved it brings breath-catching moments of anxiety. Is this the real thing? If so, will it get out of hand and spread to the powder magazines? There's the thought that nothing serious can happen here, followed by doubt. It can happen, and maybe has!

Commanding Officer J. J. Perecko, his staff officers, and civilian department heads all had the same thought in mind as they travelled toward the Heating Plant.

Reaching the scene, they found the civilian fire fighters assisted by a Marine contingent, starting to spray a huge coal pile with two streams of water.

The Fire Division Officer, Marine Captain Brown, and his Executive Officer, First Lieutenant Phelps, were standing by taking note of the action.

This was a good sign, for the new arrivals then knew that it was a drill, one drill a week being held during regular work hours, and one a month carried out after the end of the day shift.

* * *

Throughout the night the snow blanketed the grounds and buildings, then at day's approach a howling, cold, wind swirled the snow from the concrete and macadam and piled it in mounds on the fields between the warehouses and production buildings.

By noon the wind subsided, and a sun without warmth shown overhead. At 1350 the blast of the fire alarm caused all ears to perk to attention.

"One." An interval. "One-two-three-four."

"Fourteen, the black powder Quilting House!"

A fire engine and the Marine contingent, with the Medical Officer aboard, arrived at box 14 at the same time. Employees from the Quilting House had manned their posts and had a hose line connected.

Fire Chief Pagano began to issue instructions.

The scene could have been enacted at the North Pole, and the "two-blast termination of fire drill," was welcomed by all involved.

* * *

The guided missile carrier finished its on-loading, then made its way out to the channel and headed for the Delaware Bay, as rain clouds hovered overhead.

A bend in the river hid the warship from view at 1550, and the blast of the fire alarm caused all heads to perk to attention.

"One-two." An interval. "One-two - three - four - five - six - seven - eight."

WILLIAM CUTHBERT is Safety Inspector, Naval Ammunition Depot, Fort Mifflin, Philadelphia.

TRAINEES simulate rescue of "unconscious" man from second story window.

EXPLOSIVES magazine door is covered during simulated grass fire scene.

"Twenty-eight, pier No. 2!"

The fire fighters with the Marine supplement were spraying a steady stream of water on the pier when the rain clouds clashed, then burst.

Until the two blasts sounded, everyone had a soaking time.

* * *

These episodes, unlike the one below, are hypothetical composites of the fire prevention and training drills.

"Actual cause unknown, possible cause cigarette thrown out of automobile from road along perimeter fence." This statement was part of the report of a fire which occurred last November.

A Marine sentry was walking post near the West Gate, which is remote from the production area. He sniffed the air as he became aware of smoke.

"Could it be a fire?" he asked himself, his eyes searching for a telltale flame. Then he saw, not flame, but smoke curling at the corner of a portable shed a short distance down the road.

At a fire alarm box on a nearby pole the Marine immediately lowered the glass-panelled window and pulled the lever.

Minutes later when the fire engines arrived, the Marine was stamping out the fire in some dried grass alongside the shed, although he was unable to attack the original fire itself.

Fire Chief Pagano found the lock on the shed door intact and unlocked it to reach a small blaze in a corner which apparently had burned through the flooring from outside.

The fire was quickly extinguished.

Seven civilian fire fighters, headed by Chief Carmen Pagano, are mainly responsible for fire protection and prevention at the Naval Ammunition Depot, Fort Mifflin.

Theirs is a unique job, three of them are on duty at all times during a seven-day week, 24-hour day.

The job demands a continuous round of inspections of equipment and property, and a training program.

This training program is well rounded. Separate classes are held for Marine personnel and for civilian employees. The fire fighters also cooperate with the Army Engineers at the adjacent historical Fort Mifflin, and conduct classes for their personnel.

FIRE CHIEF PAGANO instructs civilian employees in proper use of gas mask.

DATA SHEET D-443
(Formerly HPP No. 3)

LEAD

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Introduction

1. This data sheet is confined to a discussion of methods of detecting lead poisoning hazards through chemical-physical tests and analyses, safeguarding lead processes through properly designed ventilation and exhaust equipment, and selecting and training employees to work safely in lead exposures. While the effects of lead on systems of the body, manifestations of poisoning, and avenues of lead absorption into the body will be listed, such presentation is only for the purpose of indicating the importance of adequate protective measures.

Properties

2. Lead and its compounds are among the most widely used materials in industry. Metallic lead is silvery gray, very soft, and has a very low tensile strength. The density of lead is 11.34 (20°/4°C), its melting point is 327.4°C (621.32°F), and its boiling point is 1620°C (2948°F) at atmospheric pressure. Lead is only slightly soluble in either cold or hot water, while it is soluble in nitric acid and hot concentrated sulphuric acid. It withstands the action of most acids to a marked degree at ordinary temperatures. Molten lead gives off noxious fumes of lead and lead oxide (in measurable quantities at 800°C) and the quantity of fumes increases with the temperature. The crystaline form of lead is monoclinic. (See paragraph 47.)

3. While lead is the softest of all base metals used in the commercial arts, it is also the heaviest. It contracts considerably on cooling; hence, it is not adapted for casting in the unalloyed state, if shrinkage is important. Lead is very malleable and may be beaten out to any desired shape, but it can be easily torn since it lacks tenacity. On exposure to air, lead oxidizes quickly, forming a protective coating which limits, to some extent, further oxidation.

This Data Sheet is one of a series published by the National Safety Council, reflecting experience from many sources. Not every acceptable procedure is necessarily included. Data Sheets should not be confused with American Standard Safety Codes, federal laws, insurance requirements, state laws, rules and regulations, or municipal ordinances.

4. Galena, or lead sulphide, is the most widely distributed form of lead ore. This is found principally in England (in Wales and Derbyshire), in the United States (principally in Missouri, Idaho, Utah, Montana and Arizona, and also in Illinois, Oklahoma and some other states), and in Spain and Germany. This ore is usually found in quartz veins or limestone beds. Another lead ore found in the United States is white lead ore, or cerussite (lead carbonate).

5. The most common form of lead used in industry is metallic lead. Many compounds of lead also are used, and where these are encountered, a lead hazard may exist. Among the commoner compounds are the following:

Lead acetate (sugar of lead)
Lead arsenate
Lead borate
Lead carbonate
Lead carbonate, basic (white lead)
Lead chlorate
Lead chloride
Lead chromate (chrome yellow)
Lead chromate, basic (chrome red)
Lead cyanate
Lead cyanide
Lead dioxide
Lead fluoride
Lead monoxide (massicotite)
Lead monoxide, basic (litharge)
Lead nitrate
Lead oleate
Lead, red (minium)
Lead silicate
Lead stearate
Lead suboxide
Lead sulphate
Lead sulphide

6. There are many other compounds of lead that may be used in industry and which may present a lead hazard. Among these are lead azide, lead bromate, lead bromide, lead dichromate, lead dithionate, lead formate, lead hydroxide, lead phosphate, lead selenide, lead thiosulphate, lead tungstate, and others. While most of these compounds do not have wide application in general industrial operations, they may, nevertheless, be used in quantities for certain industrial and chemical operations. Where this is the case, precautions should be taken against exposure of employees to lead hazards. (See Figure 1.)

7. Tetraethyl lead deserves separate discussion. It is the only type of lead compound that will be absorbed quickly through healthy, unbroken skin. It is an oily, liquid, organic compound of

lead that is dangerously volatile at ordinary temperatures. For these reasons, it is highly dangerous and must be manufactured and handled with great care against inhalation of vapor and contact with the skin. The chief use of tetraethyl lead is as an anti-knock for motor gasoline. It has also been used in small quantities in the manufacture of other chemicals. Regulations governing the use of tetraethyl lead have been developed by the principal manufacturers of the compound. These regulations are rigid and should be closely followed. (See *Regulations for Handling and Mixing Ethyl Fluid*, issued by the Medical Department, Ethyl Corporation.)

8. The presence of lead in commercial products is sometimes unknown to the management, the foreman, or the workers because the label or description gives no indication that lead is present. As a result, employees may be exposed to a serious lead hazard, or may even contract lead poisoning before it is discovered that a lead compound is in use. Suppliers of lead-containing materials should issue definite warning of the lead content by clearly worded labels; and purchasers should insist on this practice.

Manifestations of Poisoning

9. Some knowledge regarding the action of lead on the body and the symptoms of lead poisoning is valuable to the industrial hygienist and other personnel in safety work, notwithstanding the fact that these are primarily the problems of the industrial physician. For this reason, this data sheet is confined principally to the prevention of lead poisoning, but there is brief treatment of medical aspects.

10. In considering the effects of lead on the body, it is important to recognize individual variations in susceptibility. This and other factors, such as length of exposure, have made it difficult to establish a standard poisonous dose of lead applicable to all persons and conditions. There are, however, generally accepted maximum permissible limits for eight hours' continuous exposure. (See Paragraph 38.) The effects of the toxicity of lead may be widespread. The following systems of the body may be concerned:

Blood

Gastro-intestinal system

Nervous system

Cardio-vascular system (heart-circulation)

Urinary system (particularly the kidneys)

Reproductive system

11. The first thing the layman must realize about lead poisoning is that there is no one subjective symptom or objective clinical sign which is positively indicative of lead poisoning. In some cases, so-called "chronic" lead poisoning may be one of the most difficult of the occupational diseases to diagnose. A physician must make the diagnosis in the light of the history of lead exposure, occupational or otherwise; subjective symptoms; objective clinical signs, and laboratory tests.

12. There are, however, general manifestations of the poisonous effect of lead absorption. It should be remembered that whenever there is lead exposure there is potential danger from absorption of the lead. The degree of danger depends upon the extent and duration of the exposure and the control measures in effect. Some of the more common manifestations of lead absorption are listed below. Where these manifestations are noted, the individual should be referred to a physician at once.

a. Disturbances of the digestive system, in the form of lack of appetite, constipation, vague abdominal discomfort, and in more severe cases, severe cramping abdominal pains (colic).

b. Pain and stiffness in joints, bones, and muscles (particularly the muscles most used).

c. General weakness, loss of weight, and pallor.

d. Loss of strength in the fingers, hands, or forearms, and inability to use them in the performance of customary tasks.

e. Damage to the blood, possibly causing anemia.

13. In addition, there may be nervousness, muscular twitching and tremors, particularly of the fingers. The incidence of fever is rare, but there may occasionally be a slight jaundice and sometimes increased blood pressure. Sometimes in lead encephalopa-

FIGURE 1. Exhaust system with hoods that can be brought close to operations protects these workers from lead dust. (Courtesy Zenith Radio Corp.)

thy (disorder of the brain), irritability, excitement, delirium, convulsions, and ocular disturbances such as amblyopia or blindness occur.

14. Active lead poisoning cases may fall into one of the definite types familiar to industrial physicians, but the co-existence of more than one type is also recognized. This merely emphasizes that the above list of signs of lead poisoning is for use in prevention of the occurrence of disabling diseases and that there should be thorough medical supervision of all employees exposed to lead hazards. It is obvious that where cases of lead absorption are detected during the initial stages, the individual can be removed from the hazard and the onset of lead poisoning prevented. Even where individuals are thought to be exposed to only a minor lead absorption hazard and are referred to a physician, urine and blood tests may indicate too much lead absorption. Here, again, when the victim can be removed from the exposure and adequate treatment given, development of lead intoxication will be prevented.

15. The second point which should be clarified is the difference between "ingested lead," "lead absorption," and "lead poisoning." Lead found in the feces is an evidence that some lead has passed through the gastro-intestinal tract without being absorbed by the body proper. Absorption of lead is indicated by lead found in urine or blood examinations. Lead poisoning begins when the lead in the blood and the body organs actually begins to exert harmful effects. Lead poisoning is also referred to as "plumbism" or lead intoxication. Absorption of too much lead into the blood indicates that action must be taken to prevent further absorption by eliminating the source, and that medical treatment may be necessary to prevent systemic damage.

16. Lead absorption and poisoning may be indicated on physical examination by the finding of a typical lead line in the gums. The lead line under magnification will stand out as a distinct row of blue dots in the gum tissue near the tooth margin. Absence of a lead line does not necessarily indicate that lead absorption has not taken place. However, according to one authority, if a lead line is absent in a mouth where marked oral sepsis exists, it usually indicates that there is no serious amount of circulating lead in the body.

17. Lead absorption is also indicated by lead in the urine. Here again, the results of such examinations must be judged by physicians in the light of clinical symptoms. In normal individuals with no occupational exposure, lead in the urine may range from 0.01 to 0.08 milligrams per liter, and occasional values as high as 0.10 milligrams per liter, the normal average being about 0.035 milligrams per liter. Lead concentrations in the upper range of normal values, i.e., well above the mean value, while not definitely indicative of occupational lead exposure, suggest further investigation to establish the facts with reference to lead exposure. The samples tested must be obtained by the most scrupulously careful means under the direction of an experienced person. Otherwise contamination of the samples in the process of collection is certain to occur. Depending upon the size of the plant, this supervision may fall to the industrial physician, chemist or laboratory technician. The source of abnormal lead absorption must be clearly established, and the possibility that lead may be absorbed from other than occupational exposure must be considered.

18. The amount of lead in the blood as a criterion of lead poisoning is frequently brought to the attention of personnel and safety men in connection with employees who are being routinely examined for lead absorption. In the normal individual, according to one authority, blood lead values will range from 0.01 to 0.06 milligrams per 100 grams of whole blood with an occasional value as high as 0.07. The mean value for the normal individual is approximately 0.03 per 100 grams of whole blood. Here, again, the advice of a physician is necessary since investigators have found that even where 0.15 to 0.2 milligrams of lead per 100 grams of whole blood are present, the individual is not necessarily suffering from lead poisoning. But this is an indication of a possible lead hazard and action is necessary.

Entrance of Lead into the Body

19. Lead and its compounds can be taken into the body by inhalation, ingestion, or absorption through the skin. Inhalation is now recognized as by far the principal means of absorption. Inhalation exposures, however, offer greatest possibilities for improvement or control by engineering means. In spite of the high amount of lead which may enter the body by inhalation, as compared to either ingestion or absorption through the skin, users of lead compounds should not assume that the danger is negligible where only an ingestion or absorption hazard through the skin exists. Absorption through the skin is important in the case of lead tetraethyl and other organic lead compounds. If sufficient lead is ingested day after day because of improper personal hygiene, lead poisoning will certainly occur. Likewise, if lead tetraethyl or possibly other lead compounds are handled carelessly, absorption will take place through the skin in sufficient quantities to cause poisoning. Where the skin is scratched or irritated, it is possible to absorb considerably more lead than if the skin is undamaged. Where tetraethyl is used, this hazard is acute and must be guarded against.

Inhaled Lead

20. When minute particles of lead and its compounds are inspired with air, much of it is carried into the mouth or throat and is either swallowed, expectorated, or blown out with the expired air. The remainder is drawn into the lungs and deposited on the lung tissues. Lead in the lungs is capable of rapid absorption and distribution into body tissues, since

here it is in intimate contact with the body fluids. Lead, after dissolving in the lung fluid, is absorbed by the blood, and then circulated through the body. When this occurs, the lead is dangerous and is capable, in sufficient quantities, of producing systemic damage.

Ingested Lead

21. Where lead is swallowed, the greater part of it passes unchanged into the gastro-intestinal system and thus is eliminated in the feces. The greater portion of the lead which is absorbed from the gastro-intestinal tract is carried to the liver. It eventually finds its way into other tissues of the body and also back into the intestines by way of the bile. Lead in the blood may be deposited in the bones or body organs, or be eliminated through the urine. Where lead remains in the body, a high proportion of it is ultimately deposited in the bones. Authorities differ as to how damage to the body may take place subsequent to the deposition of lead in the bones. Some have suggested that the flow of lead may be reversed from the bones into the blood (where it may, if present in sufficient quantities, cause lead poisoning), because of acidosis, changes of diet, or respiratory illness. Other authorities doubt that the above factors are chiefly responsible for the mobilization of lead from the skeleton. It is generally agreed, however, that persons who may have lead deposited in their bones, or who are exposed to lead poisoning, should refrain from overindulgence (particularly in alcoholic beverages) and faulty diet.

Dermatitis from Lead Compounds

22. Metallic lead itself has never been reported to cause dermatitis, but some lead compounds cause skin irritations among workers handling them. Schwartz and Tulipan, in *Occupational Diseases of the Skin*, state that skin eruptions have been reported from contact with preparations containing lead acetate, and that lead arsenate and lead chromate may cause occupational dermatitis. Dermatitis has been reported among munitions workers from lead azide and lead styphnate. It is believed that dermatitis caused by lead compounds is due to the acid radical part of the compound rather than to the lead.

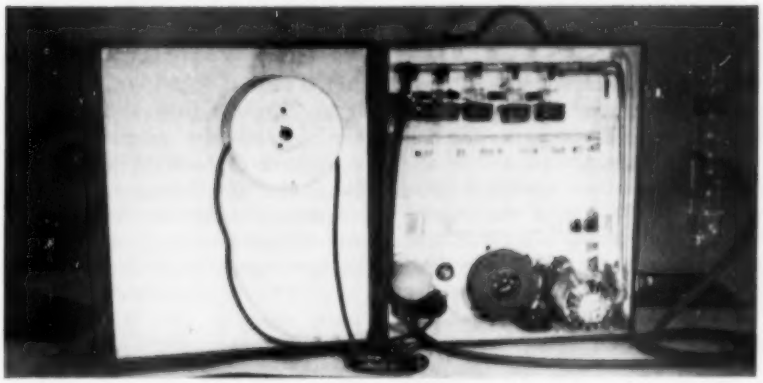

FIGURE 2. Impinger for lead sampling. (Courtesy Illinois State Department of Labor.)

23. According to Drs. Fairhall and Sayers, who have conducted extensive experiments, all lead compounds do not have the same *relative* degree of toxicity. Some are highly toxic, while others are toxic only after long exposure. These two authorities, in United States Public Health Bulletin No. 253, *Relative Toxicity of Lead and Some of its Common Compounds*, have developed, as the result of their experiments, a table of the relative toxicities of certain lead compounds based on their solubilities.

24. Regardless of the relative toxicity of lead compounds to which an individual is exposed, lead poisoning can and will occur if sufficient concentrations of lead compounds are breathed, or if the worker swallows sufficient quantities over a long enough period. It should not be considered that preventive measures can be neglected or even minimized because the compound in use is allegedly less toxic than others.

25. According to some authorities, the comparative toxicity of lead compounds is based on a number of variables, the most important of which is their solubility in the body fluids. Among the other factors affecting the toxicity are:

a. Portal of entry
b. Quantity present in the circulation at any given time
c. Speed with which compound goes into solution
d. Size and weight of particles
e. Length of time in contact with body fluids
f. Quantity inhaled or swallowed
g. Degree of acidity of body fluids

Determination of Concentrations of Lead in Air

26. Where lead or lead compounds are used in industrial processes, it is important to know whether the measures of control in effect are adequate to protect the men exposed. Then, too, it is highly important at times to evaluate a possible hazard to determine whether control measures are necessary. Concentrations of lead in workroom air can be determined by accepted methods of collection, and subsequent analysis. Two devices in use for air sampling where lead is, or is thought to be, present are the impinger and the electrostatic precipitator. The former is in greater general use, but the latter is considered more efficient for fumes. (For further information, see Littlefield, J. B., Feicht, P. L., and Schrenk, H. H., *Efficiency of Impingers for Collecting Lead Dusts and Fumes*, Bulletin No. 3401, published by the United States Department of the Interior, Bureau of Mines, May 1938.

Impinger

27. The impinger was originally designed by Greenburg, of the United States Public Health Service, and Smith, of the United States Bureau of Mines. There are now several varieties of the

original design, but all operate on the same principle. An air sample is drawn through a collecting tube at a measured rate of flow and is discharged under a liquid through a taper-pointed tube, which impinges the air and its entrained impurities against a glass plate or the bottom of the collecting flask. When a representative sample has been taken, the flask is disconnected from the apparatus and transported to the laboratory for analysis. (See Figure 2.)

28. Impingers may be obtained in several sizes, the one selected depending upon the volume of air that must be drawn through the apparatus to get a representative sample in a measured time. Two sizes are generally used, calibrated for a maximum flow of one cubic foot per minute, and 0.1 cubic foot per minute, respectively. The latter type is known as the "midget" impinger.

29. The sample of air to be tested may be drawn through the impinger by one of several methods: a compressed air ejector, an electrically driven blower or vacuum pump, or a manually driven suction pump. The hand-operated suction device is of especial value for field work where electrical power or compressed air is not available, or where samples must be taken in a flammable or explosive atmosphere.

Electrostatic Precipitator

30. The electrostatic precipitator is especially adapted to the collection of lead fumes. As in the case of the impinger, there are variations of construction and design of precipitators, but the principle of operation is the same for each. One precipitator which has been used in the field, and is available commercially, consists chiefly of a small blower to pull in the air sample, a precipitation chamber, and a power supply. The precipitation unit is essentially a grounded cylindrical metal tube which acts as the collecting electrode and a central electrode which acts as the ionizing and precipitating electrode. The central electrode has one end spun in the shape of a bullet-nose and contains a small platinum wire extending from the spun end. Both electrodes are small aluminum tubes. For sampling, the electrodes are placed in a head which is supported on a telescoping tube which functions as an air connection to the blower. Particles collected are given an electric charge as they enter the precipitation chamber and are then forced to the outer electrode in a much stronger electrostatic field. Air flow is measured after passing through an orifice, by a manometer located near the head. Suction is obtained by use of a vacuum type motor and blower. Power supply is obtained with a transformer. (See Figure 3.)

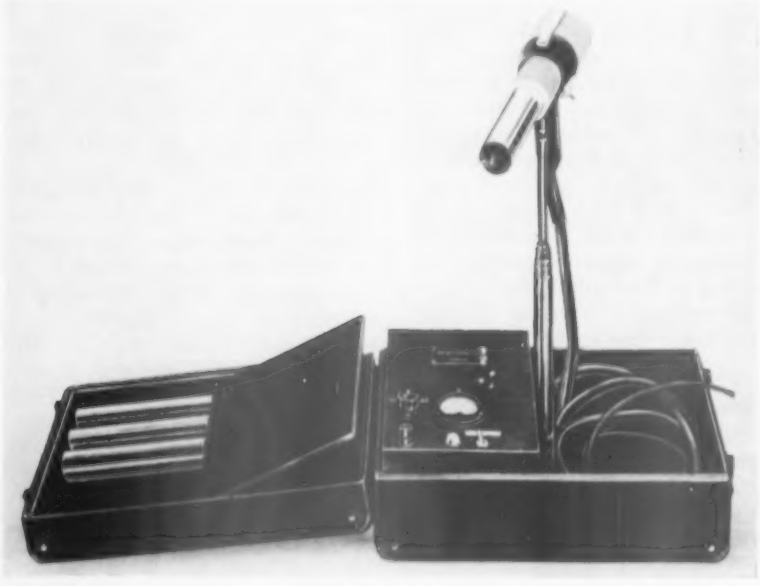

FIGURE 3. Electrostatic dust sampler outfit for lead fumes. (Courtesy Mine Safety Appliances Co.)

Technique in Collecting Samples

31. The collection of samples with either the impinger or the electrostatic precipitator is a job for a highly trained and skilled technician. Precise technique and a thorough knowledge of the pitfalls to be avoided are an absolute necessity for accurate sampling. Samples must be truly representative of the average conditions of exposure, (preferably taken in the breathing zone), not merely indications of high or low concentrations at certain times. For this reason, the samples must be taken under normal operating conditions and over a period that will give the average exposure (sometimes an entire shift must be covered) and, too, care must be taken that normal ventilation is not disturbed by the sampling operations. The concentration of lead present also is a factor in governing the sampling time, for where not much lead is present, samples must be taken over a longer period to get measurable quantities for analysis. Great care must be exercised to prevent contamination of sampling equipment before and after the sampling period if the results are to be accurate. (For a complete description of the technique in using an impinger and electrostatic precipitator, see Brown, Carlton E., and Schrenk, H. H., *A Technique for Use of the Impinger Method,* Information Circular 7026, Bureau of Mines, 1938; and Drinker, P., "Alternating Current Precipitator for Sanitary Analysis. I. An inexpensive precipitator unit," *Journal of Industrial Hygiene and Toxicology,* 14:364, 1932.)

Methods of Lead Analysis

32. There are a number of general methods by which collected lead may be quantitatively analyzed; the following four of which are probably best known: the colorimetric (dithizone); the spectrographic; the volumetric

(Fairhall's chromate) and the dropping mercury electrode. Many of the general methods, including those just enumerated, are applicable for analysis of lead in biological materials after suitable preparation of such samples.

33. Various investigators have established standard chemical procedures for the separation of lead from other metals, as the chromate, sulphide, or sulphate; and the subsequent determination of the lead by colorimetric, titrametric, or turbidimetric techniques, including several modifications. These procedures are successfully used only by skilled and careful analysts. Perhaps most widely used among these methods has been the dithizone (diphenylthiocarbazone) colorimetric method, of which there are more than 50 variations. It is sensitive enough to give results even where the concentration of lead is extremely low, involves relatively simple manipulations, and is specific under controlled conditions.

34. The dropping mercury electrode method of analysis, utilizing the polarograph, is coming into wider usage, especially for routine urine analysis. It has in its favor a comparatively simple technique and greater speed in the final determination of lead. However, this method, like others, necessitates time and care in the preparation of samples. When capably employed this method is said to yield results as accurate as those obtained by the dithizone and spectrographic method. (See Figure 4.)

35. Spectrographic analysis of materials containing lead results in a high degree of accuracy in the hands of a capable technician. The equipment is highly specialized and very sensitive.

36. Various modifications of the Fischer-Leopoldi method (making use of dithizone as a means of extracting lead quantitatively from its aqueous solutions to form a color complex), have been developed in recent years and have come to occupy an important place among procedures. The method is sufficiently sensitive to be used to determine minute quantities of lead in small samples of urine, blood, and tissues. When carried out with proper chemical technique, it is specific for lead and quantitatively precise. Several of the modifications have been described in step-by-step detail and can be relied upon when employed by careful and experienced analysts.

37. Detailed information on the technique of the methods or modifications mentioned above, as well as the several methods of analysis and recent modifications of such methods, not mentioned in this data sheet, will be furnished on request by the National Safety Council.

Maximum Permissible Concentration

38. The maximum concentration of lead in workroom air should not be permitted to exceed 0.15 milligrams per cubic meter (or 1.5 milligrams per 10 cubic meters) for continuous exposure. This standard is generally accepted in the United States. Among the several regulating bodies that adhere to this value are the United States Public Health Service, the Connecticut Department of Health, the Massachusetts Department of Labor, the California Industrial Accident Commission, the Illinois Department of Labor, the New York State Department of Labor, and the Wisconsin Industrial Commission.

39. Where tests of workroom air show a greater concentration than 0.15 milligrams per cubic meter, check tests should be made at once to determine whether the excess of lead found is due to a permanently existing condition in the process or merely to some temporary or unusual condition. Where check tests show that the maximum permissible limit is being exceeded, steps should be taken at once to lower the concentration to a safe limit. After safeguards have been applied, routine tests should be made to determine adequacy. In determining whether the maximum permissible limit is being exceeded, it is important that tests be made over an entire cycle of the operation, and not merely some high or low point.

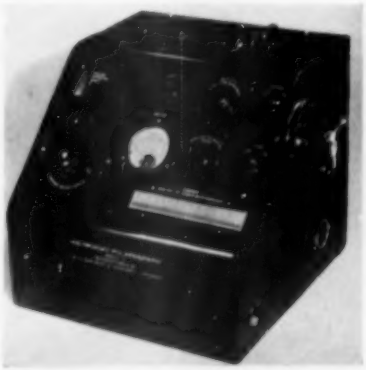

FIGURE 4. Polarograph for determination of lead. (Courtesy E. H. Sargent and Co.)

Prevention

40. The most obvious method of preventing lead poisoning is to substitute for lead and its compounds other materials that are nontoxic. However, this is rarely practicable, and recourse must be had to control of environment and training of employees, to prevent the absorption of lead.

Control of Environment

41. New plants erected for lead processes should be designed to minimize lead exposure. All floors should be of impervious material and easily cleaned. Ledges, window sills, structural iron work or other projections on which dust might lodge should be filled in or angled off. The layout of machines and equipment should be such that maintenance is made easy. Arrangements should be made, wherever possible, to isolate all lead operations so that the least number of employees will be exposed. Vacuum cleaning systems, discharging exhaust air in a safe place, should be built-in while the building is being erected, and the wash, locker and lunch rooms should be separate from the general workroom. In existing plants where it is not possible to build-in permanent vacuum cleaning systems, portable vacuum cleaning apparatus should be used. Such equipment not only makes the cleaning of the plant easier, but in addition makes it possible to remove dust

from walls and ledges which otherwise might not be cleaned. Care must be exercised in dumping or cleaning dross from the vacuum cleaners, so that further lead exposure will not be created by the spread of dust in the dumping area. The danger of dust on walls and ledges, of course, is that vibration or draft may cause it to be swept into the general workroom air.

42. In designing locker rooms, it is preferable that employees exposed to lead hazards be provided with double lockers, one side for their clean clothes and one side for their work clothes. Warm water and soap should be provided, and a sufficient number of shower baths and wash fountains should be installed so that employees will not neglect cleaning up because of possible overcrowding. (See Figure 5.)

FIGURE 5. Good wash facilities near lead operations.

Ventilation

43. The type of general ventilation and local exhaust equipment applied to lead hazards will depend in great measure on the type of building, the particular compounds used, and the method of manufacture. Fundamentals which should be considered by the engineer designing the system are:

a. All requirements of the state department of labor should be carefully followed, and plans should be submitted for approval where required or where the service is available.

b. Care should be taken when laying out the system that the air inlet is in such a location that only uncontaminated air is drawn into the system. The inlet volume should be commensurate with the exhaust volume. Sometimes it is necessary in cold weather to heat incoming air so that the exhaust system will function properly.

c. It is preferable not to recirculate to other departments exhaust air from a department with lead exposure. Where air is recirculated or exhausted directly to the outside it is highly advisable to install some system for recovering from exhaust air the lead compound which is picked up by the exhaust or ventilating system to prevent recirculation or contamination of air in the vicinity of the plant.

d. The system should be laid out so that it is foolproof and so tampering by employees cannot take place without discovery.

e. On every job where lead dust or lead fumes are given off, local exhaust should be applied that will limit the concentration of dust or fumes in the breathing zone of workers at or below the maximum permissible concentration of 1.5 milligrams per 10 cubic meters of air for continuous exposure. (See Figure 6.)

f. Local exhaust systems, when applied, should be so designed that they will not interfere with the operating efficiency of the general ventilating system and vice versa. Cross currents of air and dead air pockets should be avoided. It is sometimes necessary to resort to air line respirators or masks for cutting or welding operations, particularly where large parts are involved. Such respiratory protective equipment is satisfactory, but care should be taken not to expose other employees in the area, who are not protected.

g. Only exhaust and ventilation systems designed by experts in that field should be installed. Repairs to existing systems should never be made by amateurs. Where state laws require it, or where this service is available, repairs should never be made without first consulting the state department of labor.

h. All ventilating, local exhaust, and

FIGURE 6. Local exhaust system on automatic brake-lining finishing machine. (Courtesy Chrysler Corp.)

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dust collecting systems designed for control of lead exposures should be checked periodically for efficiency by a qualified engineer.

44. In many cases, exhaust equipment for specific operations will have to be especially designed for the job. For instance, Figure 7 illustrates a ring-type exhauster which effectively prevents lead carbonate dust from spreading into the surrounding workroom air during loading of basic lead carbonate into metal drums or barrels.

Respiratory Protective Equipment

45. For certain classes of exposure, such as general spray painting, spray painting structural steel, lead burning, cutting and welding of lead-coated steel, and for use during emergency, respirators of a type approved by the U. S. Bureau of Mines should be used. For continued protection against lead exposures, a properly designed, installed and maintained ventilation and exhaust system is highly advisable; however, where respirators offer the only practical type of protection their use should be insisted upon. Wherever respirators are in use, supervisory attention should be given to making the employees as comfortable in them as possible; and, particular care should be paid to the hygiene necessary in their maintenance. For lead dust, a lead dust respirator approved by the U. S. Bureau of Mines may be used. When exposure to lead fumes is involved, the U. S. Bureau of Mines approved respiratory protective equipment, such as air line respirators, or abrasive blasting helmets may be used. There is also the problem of making certain that air supplied to this equipment is clean and free from the compound against which protection is sought. Approved mechanical filter respirators may also be used for protection against lead fumes. These filters require renewal frequently, depending upon the fume concentration.

Other Control Measures

46. Particular attention should be given to the possibility of entirely enclosing lead processes so

FIGURE 7. Ring-shaped exhaust hoods for use at top of barrels. (Courtesy John P. Lewis and Brothers Co.)

the chance of fumes and dusts escaping in the workroom air is reduced to a minimum. For example, excellent work has been done in enclosing processes involving lead in the gasoline and battery manufacturing industries. (See Figure 8.)

47. When it is necessary to melt lead, the temperature should be held as close as possible to the melting point, since greater quantities of fumes are given off at elevated temperatures.

48. Wet methods of production have long been looked on with favor by some industrial hygienists and industrial physicians for preventing the discharge of dust

FIGURE 8. Totally enclosed and exhausted barrel-dumping device, discharging lead oxide into mixer on floor below. (Courtesy Willard Storage Battery Co.)

into the workroom air. Where wet methods of manufacture are applicable, they should be applied, bearing in mind the danger of lead dust, or dust of compounds of lead, being thrown into the air upon drying. Examples of wet methods are oil grinding of white lead in the paint industry, the English and German method of separating white lead powder (basic carbonate) from lead buckles by immersing them in a trough of running water, and wet pasting of lead plates in storage battery manufacture.

49. Another wet method used in various industries involves a grating over running water. Dust dropping from lead being processed falls through the grating into the water where it circulates into a recovery system.

Housekeeping

50. In addition to the installation of vacuum cleaning apparatus, it is necessary that a regularly scheduled routine for housekeeping be instituted and followed. Where there is no regular cleaning crew, definite periods should be set aside each day and all men in the department should be required to take part in cleaning up. Using compressed air for blowing lead dust or lead compound dust from floors, walls and ledges should be strictly prohibited. This is one of the most dangerous methods of cleaning, and it is certain to leave a heavy concentration of dust in the air. In some plants, such as in glazing departments of potteries, the walls, floors, ledges and ceilings are flushed off with a water hose, and all of the material is swept into a central drain.

51. Covered trash cans should be provided and employees should be instructed to use them instead of dropping material on the floor around machines or benches. Dross, especially, should be covered immediately after removing from the kettle and should be transported as soon as possible to suitable storage rooms or reducing furnaces. (See Figure 9.)

52. The practice of vigorously sweeping up floors in departments

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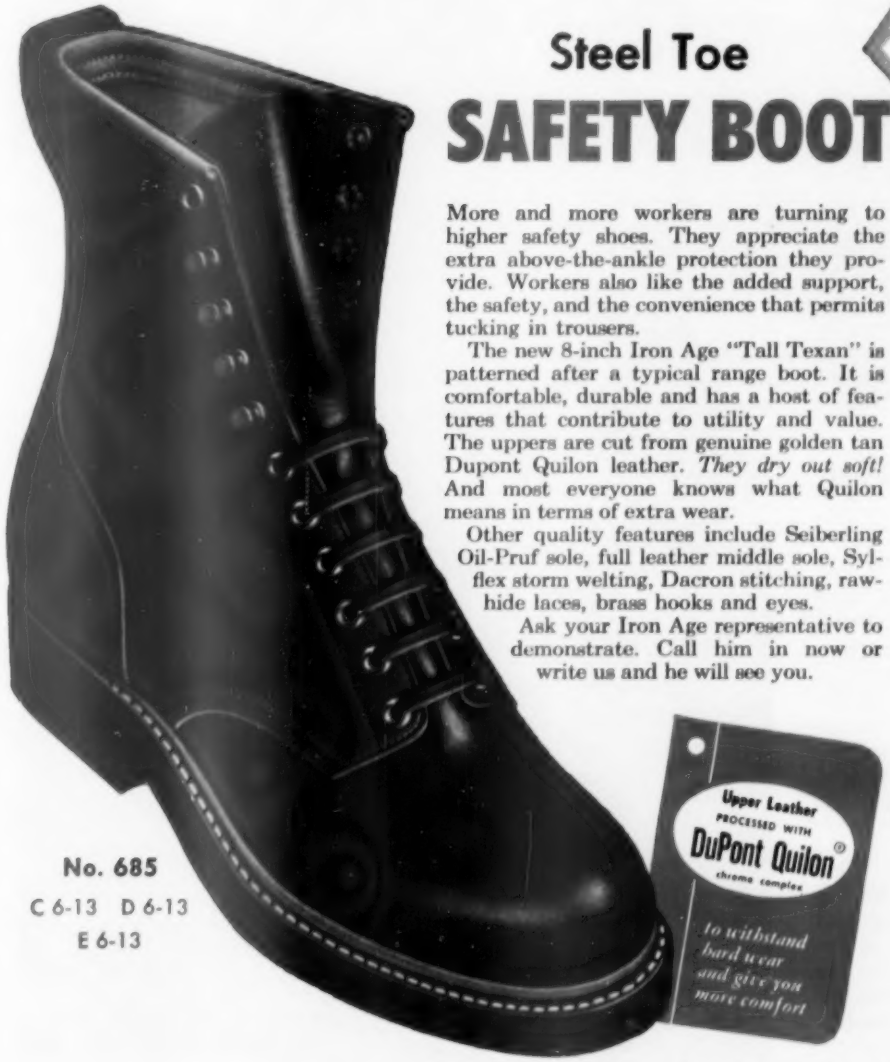

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Pittsburgh 12, Pa.

in which lead or lead compounds are used, should be prohibited. If sweeping must be employed, soft push brooms should be used, and the floor liberally sprayed with water *before* sweeping. Liberal quantities of oiled sawdust are used in some plants instead of sprinkling with water, to avoid dust being created if the water dries before sweeping is completed. Sweepers should be provided with and required to wear approved type respirators and should, if possible, perform their work at times when other employees are not exposed. Vacuum cleaning is preferable to sweeping.

53. All containers of lead compounds should be provided with covers, and should be kept closed when not in use. Where powdered material is transferred from barrels to mixing or other process machines, covered scoops should be used for the purpose or some mechanical means of transferring should be employed that will prevent contamination of the workroom air. Ring-shaped exhaust hoods that fit the top of barrels may also be used.

Selection and Placement of Employees

Physical Examinations

54. All employees, before being put to work on operations where there is exposure to a lead hazard, should be given a thorough physical examination by an industrial physician. The recommendations of this physician should be followed in assigning to employment any man who is examined. (See Figure 10.)

55. Possible reasons for rejection from employment where a lead exposure exists include lead intoxication, indication of an abnormal content of lead in the blood or urine, kidney trouble, stomach ulcers, heart trouble, anemia, constipation, venereal disease, tuberculosis, alcoholism, and the use of drugs. Pregnant women and adolescent boys or girls should not be employed where there is a lead hazard. It should be noted that many of these reasons for rejection from employment would also prohibit any type of employment.

56. Re-examination of employees should be made at regular intervals, the intervals to depend on the recommendation of the industrial physician making the examination, on the lead exposure that exists, or on state labor department requirements. In general, where lead or lead compounds are extensively used in the plant, employees should be given complete physical examinations at least once a year, preferably more often, and they should be examined monthly by the plant physician to determine whether or not lead absorption has taken place. Microscopic blood examinations (basophilic aggregation tests, stippled cells) or urinalysis should be made and the general health of the individual carefully studied. Employees should have the privilege of reporting to the plant physician for a further check-up anytime they do not feel well. One authority suggests that physical examinations be given every six months where metallic lead is used, monthly where molten lead or compounds are used, and every two weeks if white lead or red lead is used. Where the question of frequency of examinations arises, it should be answered by the industrial physician, after the engineering details of the physical environment have been carefully considered and evaluated for or by him.

57. The medical department plays an important part in plants where there is a lead hazard. Hence, its activities should be properly integrated with other prevention work. The medical department should act as a check on the efficiency of the control measures in the plant. For this reason, reports of the medical department should be closely studied and where, in spite of careful control measures in effect, a high lead absorption rate is shown by certain individuals, careful inspection should be made of their work locations.

Training of Employees

58. There are certain minimum standards of education and adaptability that should be fulfilled by the prospective lead worker. These will vary considerably from

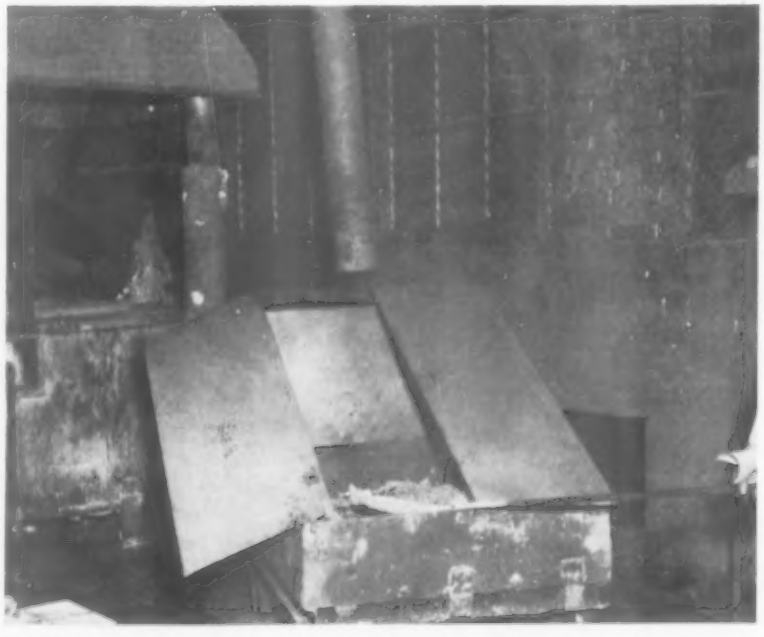

FIGURE 9. Exhausted lead-melting kettle with dross container under the same exhaust system so that dross is never exposed to workroom air. (Courtesy Willard Storage Battery Co.)

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Courtesy: Lehigh Safety Shoe Company, Emmaus, Pa.

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industry to industry, but the minimum test should be whether or not the prospective worker is adaptable and can be trained to follow safety rules. For example, inability to speak English greatly complicates the training problem. However, there is no objection to employing non-English speaking workers if provision is made for training by supervisors or instructors who can explain hazards and proper work methods in the language of those employed.

59. Once it is decided that an individual is physically and mentally able to work in lead processes, the general hazards of lead work should be carefully explained. At the same time, common sense rules of personal sanitation and company policy on safety should be presented. Before a man is finally put to work, he should be examined as to his understanding of these rules by a personnel man or the safety engineer.

60. When individuals are being "broken in" on jobs, a definite procedure should be followed to insure their knowing exactly what is to be done and how it is to be done. This is best achieved by first thoroughly explaining the job and giving the reasons for the rules. The employee should then be given a chance to state his idea of what he has been told; this gives the instructor an opportunity to correct any misunderstanding. The job should then be demonstrated by the instructors, several times if necessary, and the new employee should finally be permitted to perform the operation. Here again, an opportunity for correction of unsafe practices or inefficient work is presented. After the instructor is certain that the man understands and can do the operation safely and efficiently, the employee may be permitted to work alone, but he should be checked from time to time to make certain that all safety and health rules are obeyed. The same procedure should be followed in transferring workers from one department to another or from one operation to another.

Personal Hygiene

61. Personal cleanliness of the exposed portions of the body, the fingernails, mustaches, and hair should be insisted upon. Employees should be urged to take a shower each night before leaving the plant and to change from their work clothing to street clothing. Where lead dust collects on clothing and hair of employees, it may get into the workroom air when clothing is brushed or shaken.

62. The medical department may, from time to time, issue bulletins on proper diets for workers exposed to lead and its compounds. In some exposures, this may include the recommendation to drink milk. The workers, too, should be urged to get plenty of sleep and as much sunshine as possible.

63. Employees should be forbidden to use tobacco (smoking, chewing or snuff) in the plant, except that this may be permitted in the regular plant lunchrooms or in other designated areas during lunch hour, *after* employees have thoroughly cleansed themselves.

64. Eating in a workroom where lead is handled should be absolutely prohibited. It will be difficult to enforce this rule unless a lunchroom is provided where employees can eat in comfort. In many plants, lunchrooms have been provided in which employees can purchase, at moderate cost, a nutritious and properly balanced meal. Lunchrooms should be isolated from any lead exposure and employees should be compelled to wash their faces and hands thoroughly before eating. In some cases, it may be desirable to urge employees to change clothing before eating.

First Aid

65. There is no recognized first aid for lead poisoning. All cases of suspected lead absorption or acute attacks should be immediately referred to a physician. To delay may lead to complications.

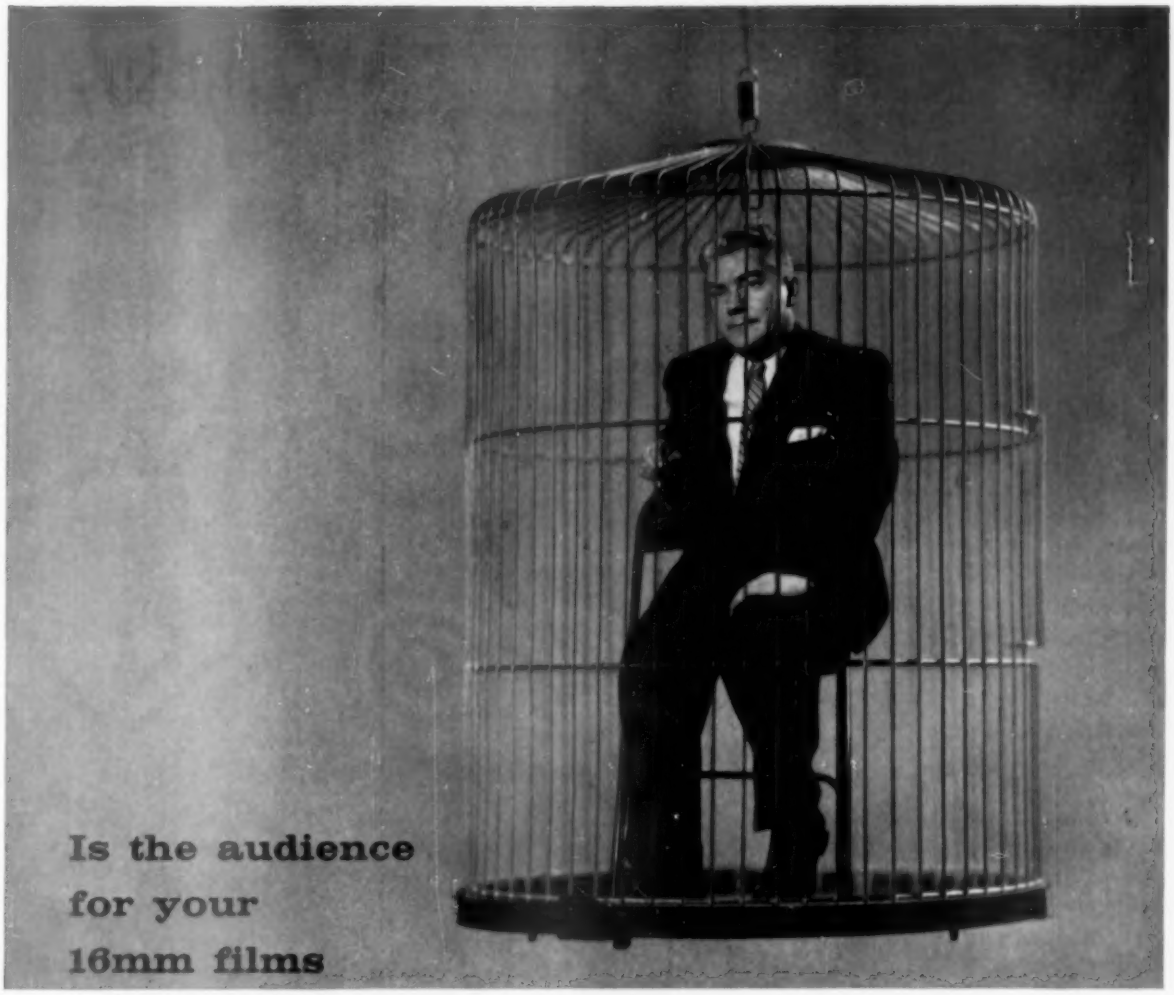
Supporting Activities for Training

66. The personnel, medical, and safety engineering departments should use every facility for stimulating and maintaining the

—To page 131

Name ..... Date seen ..... Lead study No. .....
For how long? .....
Plant address .....
History of water supply ..... Other lead sources .....
Medical attendant .....
Age ..... M. F. ..... W. O. ..... S. M. W. D. ..... Nationality .....
Births ..... Miscarriages ..... Stillbirths ..... Deaths .....
Home address .....
Industry ..... Occupation .....
How long in this industry ..... How long in present job .....
Previous employment .....
Complaint .....
Habits .....
Appetite ..... Constip. ..... Diar. ..... Naus. ..... Vom. ..... Eruct. ..... Wt. loss ..... lbs. in .....
Abdominal pain-distress ..... Where ..... When .....
Memory ..... Vision ..... Headache ..... Vertigo ..... Ataxia ..... Asthenia .....
Joint pain ..... Paresthesia ..... Strabismus .....
Pb line ..... Pallor ..... Weakness Flex. ..... Ext. ..... R. & L. ..... Wr. Dr. ..... Toe Dr. .....
Blood Hgb. ..... RBC .....
Stippling ..... Diff. ..... P ..... LM ..... LL ..... SL ..... M ..... E ..... Tr .....
Diagnosis .....

FIGURE 10. A special form for preplacement and periodic medical examinations of lead workers.



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SAMMY SAFETY'S NOTEBOOK

By Arthur S. Kelly

Industrial Department, NSC

A Belated Thank-You

We present two ideas this month, one from a previous contributor and one from a newcomer.

A moment's reflection brings to mind that in our concern for this struggling feature, we have been guilty of a fairly universal human error; wishing so hard for something we don't have that we neglect to be grateful for what we do have.

So, tardily, we acknowledge with sincere thanks all those who have sent in suggestions this past year. The ideas and devices have helped a lot of people . . . just like we said they would.

* * *

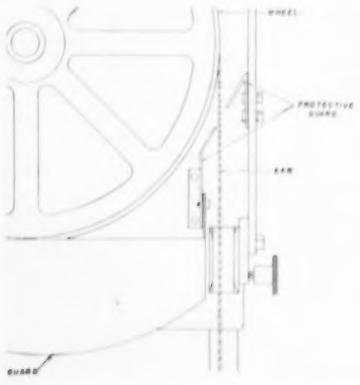
The winner in January was Robert S. Weaver, personnel manager, Paper Package Company, Indianapolis, Ind., for his entry on warning lights for industrial trucks.

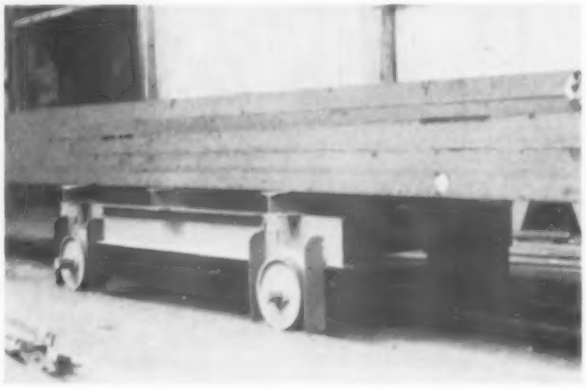
Protection Against Broken Saw Blades

Here is a simple solution to one of the hazards of operating a band saw—protection against a broken blade spewing out like a serpent and creating about as much damage.

The sketch shows the simplicity of arrangement and how the broken blade will be deflected by the top portion of the guard, which confines it within the wheel enclosure.

Submitted by James McClimans, Westinghouse Electric Corporation, Sharon, Pa.



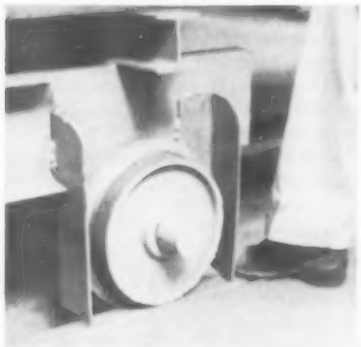


Wheel Guards for Transport Buggy

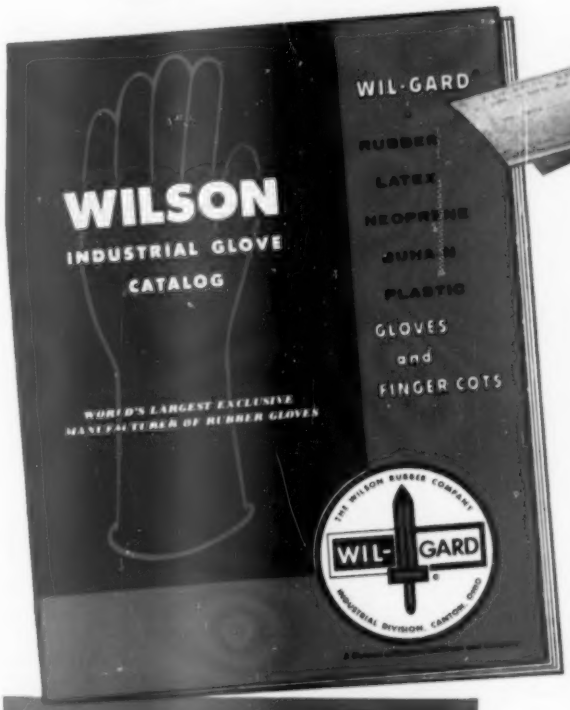
A glance at the close-up photo at right shows how surely a foot, planted on the track in front of the wheel of this transport buggy, will be pushed out of the way instead of being mashed to a pulp or amputated.

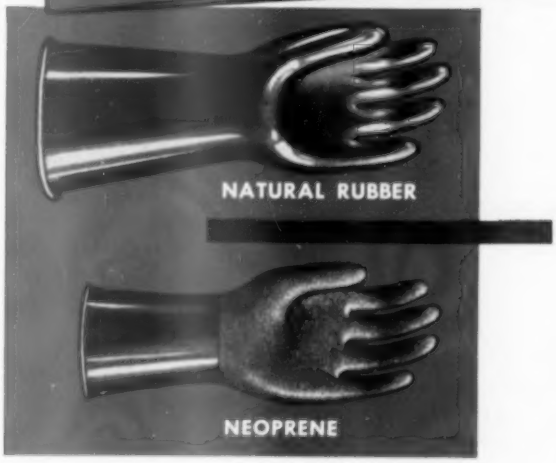
The guards are made of 5 x 3½ x ⅜ in. angle welded to the buggy. Since they can be set as close to the track as desirable, they also will prevent the buggy running over welding cable, air hoses, or material.

Credit for this device goes to L. Foral, E. Blakemore, and R. Ford, all foremen in the structural shop of Robberson Steel Company, Oklahoma City, Okla.



You *CAN* Reduce COMPENSATION COSTS...





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INDUSTRIAL HEALTH

Abstracts of current literature
on Occupational Hygiene, Medicine, and Nursing

By F. A. Van Atta, *Director, Research Division, NSC*

The Skyward Trend of Compensation Costs

"Where Are We Going in Workmen's Compensation?" by Christopher Leggo. *Industrial Medicine and Surgery*, 25:559-562 (Dec. 1956).

WORKMEN'S COMPENSATION Acts were originally passed to secure to the workman medical care and financial damages for injuries which he suffered in industry. In return for the certainty of paying for an injury and for the loss of his traditional common law defenses, the employer was protected by a ceiling on the awards which could be made.

Recently the immunity from high awards seems to have been wearing off. In states which provide unlimited medical care such costs have become very high indeed. In view of the occasional real need for prolonged medical care this is something which should not be changed without careful consideration.

The other form of increased costs has occurred in the recent rash of subrogation cases. In these the awards seemed to be based in many instances on the emotional state of the juries rather than on the merits of the case.

The traditional tendency in most states has been for the authorities to resolve doubts about compensation matters in favor of the employee. There are exceptions, but this is the pattern in general. It it a tendency which has not been seriously opposed by either the employers or their insurers, probably because of a feeling that substantial justice was being obtained.

When California passed its Unemployment Disability Law late in 1946, it seemed that the reason for some of the more dubious compensation claims would disappear since the individual would receive compensation under the new law if his claim was not industrial.

Experience with the law for 10 years has shown that the actual effect has been just the opposite. The very wide discrepancy between the benefits under this law and the very liberal benefits under Workmen's Compensation has jogged a lagging memory about what may have happened in industry and has greatly increased the number of Workmen's Compensation claims.

It is doubtful that this can be corrected practically by increasing the unemployment disability benefits up to those of Workmen's Compensation, but is is even less likely, and not desirable that compensation benefits can be reduced. The tendency is to increase rates rather than lower them.

One of the things which would help would be for those, including doctors, responsible for administration of compensation laws to look over and improve their logical processes. They should, in particular, eliminate the *Post hoc ergo propter hoc* reasoning, which is common in assigning causes for industrial disabilities. Just using the same sort of reasoning in industrial cases as is used in ordinary medicine would improve the operation of existing laws without any change being necessary in the laws.

Air Contaminants

"The Identification and Distribution of Air Pollutants through Plant Response," by John T. Middleton and A. A. Paulus. *AMA Archives of Industrial Health*, 14:526-532 (Dec. 1956).

AIR POLLUTION is important because of its odor, effect on visibility, distress produced in humans and animals, and damage to plants. The contaminants which are usually studied — ammonia chlorine, carbon monoxide, ethylene, hydrogen fluoride, hydrogen sulfide, mercury and sulfur dioxide—are generally more toxic to plants than to humans or animals. It has been reported that mercury vapor at 0.008 ppm. in the air is accumulated up to 3.3 ppm. in rose leaves with damage to the plants.

Hydrogen fluoride damages a variety of plants and can be recognized by the nature of the damage and the types of plants damaged. Since it is collected in the plant material and there is, as yet, no good mechanical collecting device, such plants as camellia and alfalfa can be used as passive collectors and the fluorides determined by analysis of the leaves.

The unsaturated hydrocarbons, and particularly ethylene, damage such plants as marigold and tomato at quite low concentrations and orchid flowers are damaged by 0.005 ppm. of ethylene.

Sulfur dioxide damages some plants at concentrations of 1 ppm. or less, but it is most readily determined in the atmosphere by instruments.

Plants have a specific reaction to ozone and to oxidized hydrocarbons in the atmosphere. Ozone produces bleaching and spotting of upper surfaces of leaves and oxidized hydrocarbons a silvering, glazing or bronzing of the lower surfaces. This latter effect has been recognized in the Los Angeles area since 1944 and around San Francisco since 1950. There is no plant response to oxides of nitrogen in the concentrations found in the atmosphere.

The extent of air pollution in California was surveyed in 1955

—*To page 62*

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No. 55 "Solo goggle" . . . with adjustable elastic headband.

A "Picture Window" View and Maximum Safety for BRAZING, CUTTING, GAS WELDING, GRINDING and similar hazards.

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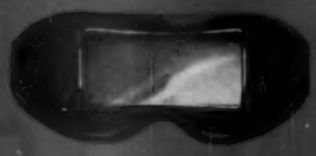
This NEW single-cup "Solo goggle" fits easily over Spectacle goggles and personal prescription glasses *for extra protection.* Molded of light, rugged plastic, "Solo goggle" is flame resistant and non-irritating to the skin. A *patented spring retainer* makes the filter lens and cover glass easy to change. The spring is of one-piece design . . . SAFE because it has no sharp ends or edges. "Solo goggle" affords a full, unobstructed view of work! *Order this newest and best eye protection NOW from your Safety and Welding Distributor!*

EXCLUSIVE Solo goggle FEATURES:

1) Wide "Picture Window" Vision.
2) May be worn slightly off-the-face . . . with no annoying spring pressure.
3) Headrest has *padded* Leather or Leatherette Sweatband, smooth for comfort, easy to replace at low cost . . . and
4) Wide Range Ratchet Adjustment to fit all head sizes.
5) Uses standard 2x4¼" Lenses . . . easily replaceable without tools.
6) Entirely SAFE . . . no spring ends or edges in eye zone!
7) Headrest with positive, single center adjustable linkage . . . for simplicity and less weight.
8) Fits over all glasses.



INSIDE VIEW of "Solo goggle" . . . showing *patented* (Designed for Safety) positive retention spring. Lens easy to replace.

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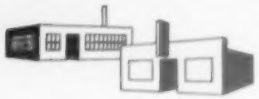


By A. M. Baltzer

Small Business Program Staff, National Safety Council

Free Congress Notes

The notes compiled by "volunteer secretaries" at the four Association Safety Exchange Groups of last October have been summarized, edited and are available in mimeographed form.

Association executives, local safety council managers and committeemen interested in safety activities at both the industry and local level are invited to write the Small Business Program, NSC, for complimentary copies.

Plaques Plug Safety

Word from some of the winners of our Association Safety Award proves that the plaques publicize safety in various ways:

- The *Wisconsin Canners' Association* displayed their plaque prominently at the registration desk during its annual convention.
- The *Pennsylvania Manufacturers' Association* publicized its achievement in its newsletter and urged other associations in the state to engage in safety activities which would permit them to qualify.
- The *Institute of Scrap Iron and Steel* sent a special mimeographed release to its 1,500 members; this association and the *Western Oil and Gas Association* sent representatives from the West Coast to receive the plaques.
- The *Pacific Coast Pulp and Paper Association*, the *Portland Cement Association* and others have reproduced facsimiles of their plaques for special publicity and annual reports and office displays.

Of course we're glad that these progressive associations get full value from the handsome plaques.

SFSA Contest Clicks

The *Steel Founders' Society of America* recently launched its 1957 Safety Poster Contest for member companies. Employees are encouraged to try for substantial cash prizes offered in the eight divisions of the Society; the four winning posters are then used in the annual safety contest during June, July and August.

ONE OF FOUR winners in the 1956 Poster Contest of the Steel Founders' Society of America.

Interest in this contest is keen; last year 327 posters were submitted by employees of 72 member foundries. Prize-winning posters are reproduced by the Association and distributed for member companies' use throughout the year.

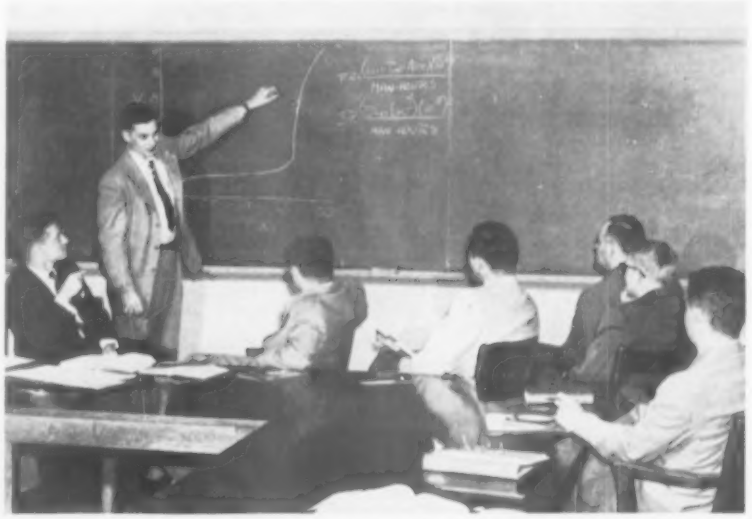
This campaign, and the annual safety contest, which it supports, helped the SFSA win our Association Safety Award in 1954.

"Plus Costs" Goes to School

The Newark College of Engineering discusses "Safety in Industry" as a part of its course on "Staff Control and Personnel Problems."

The subject is approached primarily from the point of view of the safety engineer with special emphasis placed on the "why and how" of accident prevention for personnel managers.

According to the school, our *Plus Costs* booklets proved invaluable in providing the students with supplementary information on the subject of accident prevention.



JOHN GILL (standing), a student at Newark College of Engineering, lectures classmates on safety. Copies of *Plus Costs of Accidents* furnished by the National Safety Council were distributed to the class.

Air Casualties

It's bad air that does it. But you can step up production by putting a Coppus Blower on the job to keep the air moving — and keep the men cool.

The kind of air a man works in has a lot to do with how much work he can turn out.

In confined places like shipholds or tanks or drums or boilers . . . or wherever the air is stagnant or hot or full of fumes . . . a Coppus Blower is a *must* for getting first-class work out of the men, all the time.

A Coppus Blower or Exhauster helps avoid sickness and lassitude due to bad air . . . and improves morale, too.

Portable and adaptable for special purposes, Coppus Blowers and Exhausters will have dozens of uses around your plant. The "Blue Ribbon" (a blue painted band) is your assurance of quality performance at lowest cost.

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THE BLOWERS THAT PUT MORE MINUTES IN EVERY MAN-HOUR

CABLE MANHOLE AND TANK VENTILATORS — BOILER MANHOLE BLOWERS AND EXHAUSTERS — HEAT KILLERS — SHIPHOLD VENTILATORS . . . DESIGNED FOR YOUR INDUSTRY — ENGINEERED FOR YOU

MAIL THIS COUPON To Coppus Engineering Corp., 122 Park Avenue, Worcester 2, Mass. Sales offices in THOMAS' REGISTER. Other "Blue Ribbon" Products in BEST'S SAFETY DIRECTORY.

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- ☐ on steam-heated rubber processes.
- ☐ on boiler repair jobs.

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- ☐ general man cooling.
- ☐ around cracking stills.
- ☐ exhausting welding fumes.
- ☐ stirring up stagnant air wherever men are working or material is drying.
- ☐ drying of walls, sheets, etc., after treated with coating material.

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COMPANY .....

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(Write here any special ventilating problem you may have.)

CONSULTATION CORNER

By George MacDonald, *Industrial Department, NSC*

Got a problem in accident prevention or occupational hygiene? Questions are answered by mail, a few of general interest being selected for publication here

Can Concrete Floors Cause Foot Disorders?

Question: The question has been raised in our safety meeting: "Can foot disorders develop as a result of standing on concrete floors, while working, over an extended period of time?" I have been asked to make a report at our next meeting.

Answer. The best information available is in a report made by the Federal Works Agency which states:

"Resilience tests made by the National Bureau of Standards indicate there is no great difference among concrete, asphalt, or hard wood surfaces. Fatigue is closely associated with psychological reactions and is dependent on shoe materials to a much greater extent than on floor walking surfaces.

"Floor surface temperature is directly related to the conductivity of materials used. There is no great difference in that of concrete and wood floors in corresponding types of construction.

"Besides being economical and long lasting, concrete floors have the added advantage of being easy to maintain and keep clean, and, therefore, of being a safe and healthful surface on which to work. That the belief they are too hard is 99 per cent psychological, is proved by the millions of people who work every day on concrete floors over which thin, decorative surface has been added. These thin surfaces add practically nothing to the resiliency of the floor. But by hiding the concrete they remove the psychological reaction that causes people to insist the floor is unduly hard and thus people on such floors suffer no discomfort.

"Workers who stand in one place all day long are going to find any floor surface hard. The use of rubber heels, crepe soles, or the provision of small fiber or rubber mats will add to their comfort."

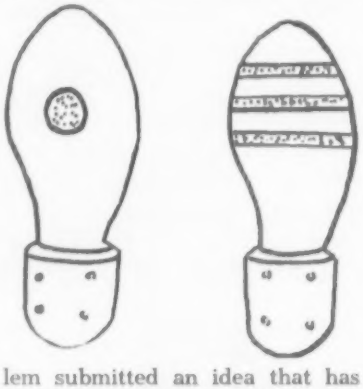
We believe the above statements to be as complete as any on this particular problem.

Homemade Device Makes Any Shoes Anti-slip

Question. We have a slipping problem in the cereal division of our food processing plant. Warm temperatures and occasional spillage make cereal room floors highly polished and slippery and a hazard to employees.

We have tried all types of non-slip shoes and have found that, although they are effective when new, they soon wear or pick up material and lose their anti-slip properties. We prefer not to glue adhesive stripping to the floor because it holds dirt and involves a washing and mopping problem.

Answer. Some time ago a member company with the same problem submitted an idea that has been very successful. After trying abrasive soles and anti-slip devices they decided to experiment with abrasive stripping.



They traced around a man's shoe, cut out a sole, and glued it to the bottom of the shoe with the abrasive side out. This seemed to work for a while, but flexing the sole while walking soon loosened the solid abrasive glued stripping and made it bulge in places.

They tried another idea using narrow stripping normally used on the nosing of stairways. Cutting the strips into small pieces, they glued them to shoe soles, allowing free spaces between strips. The accompanying drawing shows how the sole is allowed to flex between the glued strippings. Maintenance consists only of replacing one line of stripping should it come loose.

Trying a further experiment, they cut out a disc of abrasive material and glued it to the sole exactly in line with the ball of the foot. This made a positive pressure contact at all times.

They recommend that workers save wear on the glued abrasive by keeping one pair of shoes in their lockers for use only in the plant.

Alcohol As a Washing Agent

Question. Our printing plate manufacturing process includes washing one surface of a 60 x 90 in. zinc plate. The plate is placed on a large table and is flooded with approximately ½ gal. of alcohol. The plate is scrubbed with waste paper and the excess alcohol removed with a rubber squeegee. An electric fan is then directed against the plate to speed the drying.

The washing table is not hooded. However, a ventilator is installed in the ceiling, approximately 10 ft. from the table. The washing room is 20 x 20 ft. and we use 10 gal. of alcohol in a 7½-hour period.

We have recently changed from (trade name) to isopropyl alcohol and are concerned about the possible toxic effects on personnel as well as the fire hazard involved in using the electric fan directly above the wash table.

Answer. We understand that (trade name) is a commercial denatured ethyl alcohol. This sub-

MANAGEMENT:
Your report proves conclusively that we must do everything we can to protect our workers against future toe injuies.
SAFETY ENGINEER:
Yes, this one toe injury actually cost more than an entire safety shoe program.
FOREMAN:
Safety shoes cost our workers far less than regular shoes, too *

Now Available...Safety Shoes in ail Styles with the

NEW IMPROVED WINGUARD STEEL TOES

...the latest development in steel toe protection

The new improved WINGUARD safety steel toe has been our contribution to the many modern advancements made by safety shoe manufacturers in the development of safety shoes to meet the most hazardous requirements and provide your workers with maximum comfort and wear.

*Shoes stocked in plants.

Safety Box Toe Company

812 STATLER BUILDING · BOSTON

stance has a lower explosive limit of 3.28 per cent, a flash point of 55 F., and a maximum acceptable concentration of 1,000 parts of ethyl alcohol per million parts of air.

Isopropyl alcohol, on the other hand, has a lower explosive limit of 2.5 per cent, a flash point of 53 F., and a maximum acceptable concentration of 400 parts of isopropyl alcohol per million parts of air.

Assuming a steady average usage of alcohol per unit of time and even distribution of alcohol vapors throughout the workroom area, the use of 10 gallons of isopropyl alcohol in 7½ hours requires approximately 30-40 air changes per hour in the workroom in order to keep the concentration of isopropyl alcohol below 400 ppm. This, of course, is based upon over-all room ventilation.

It would be much simpler and much more economical to provide local exhaust ventilation for the wash table and thereby reduce the amount of air needed and the amount of heat needed to keep the average room temperature up to normal during the winter.

The most important recommendation that we can make is to arrive at a method of operation whereby the operator uses the absolute minimum amount of alcohol in order to do a satisfactory job. This will correspondingly reduce the amount of ventilation needed to keep the workroom air at a safe and proper level.

As far as the toxic effects of the two above mentioned materials are concerned, the effects are of the same general nature being of a narcotic nature. Since isopropyl alcohol is approximately twice as toxic as the ethyl alcohol, the control of toxic effects would be not nearly as difficult if ethyl alcohol were used.

Fiberglas Nontoxic But Can Cause Irritation

Question. Our assembly department is considering insulating part of our product with fiberglas. I have been asked for information on the prevention of irritation due to contact of the skin with fiberglas, and effects on workers' eyes and lungs. Would you please give me your opinions and recommendations?

Answer. NSC's director of industrial hygiene states that, according to the best information available, fiberglas has no adverse effects upon the eyes or lungs. Even very short lengths of the finest textile glass made are not inhalable.

The noticeable physiological effect appears to be a certain mild skin irritation to workers contacting fiberglas. This is caused purely by the mechanical action of the sharp ends of the glass fibers and not by any toxic properties of the glass itself. Glass is totally inert.

This irritation is characterized by a mild itching sensation and may be accompanied by a slight reddening of the skin and, in a few cases, small skin eruptions similar to prickly heat. It usually occurs on the hands and arms where the tiny fibers adhere to the skin, and it is increased by perspiration and by any friction or scratching that tends to rub the fiber in. It is claimed that after a few days the worker be-

The idea that solved 1000 "headaches"

The famous SBS-60 upside-down hand picture first appeared about a year ago. It dramatically illustrates how SBS-60 Cream Deodorant Soap is almost impossible to waste . . . and why it has solved literally thousands of soap "headaches" in hundreds of nationally known organizations.

What is your soap "headache"?

- **soap powder spilled all over your washrooms?**
- **bar soap wastefully dissolving on the shower room floor?**
- **liquid soap dispensers either dripping or all clogged up?**
- **constant work keeping dispensers filled and in order?**
- **complaints about your soap from both men and women?**
- **whatever your soap "headache", SBS-60 can help.**

Write and we'll send complete information that tells you just how SBS-60 Cream Deodorant Soap "cures" most of today's soap "headaches". *Write us today!* We'll rush the details to you.

SBS research developed SBS-60 after years of study. This new type of soap is proclaimed the successor to liquid and bar soaps.

Write Dept. 57-B12

sugar beet products co.

saginaw, mich. • los angeles, calif. • toronto, canada

the washword of industry

comes conditioned, and it ceases to have any adverse effects.

If the fiberglas is handled in a loose or bulk manner that might cause particles to fly into the eyes, then a face shield or close-fitting goggle should be worn. This will also prevent a tendency to rub the eyes with the hands that might be coated with fiberglas.

The principal precautionary measure to be followed is washing with mild soap and water. In some cases it is desirable to provide a barrier hand cream during the initial stages of the exposure while the operator's skin is being toughened. There are many of these creams on the market with suppliers probably in your area.

Revise Standards for Surgical Dressings

A REVISION of Simplified Practice Recommendation R133-49, *Surgical Dressings*, has been submitted to producers, distributors, users and others concerned for revision and acceptance, the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, has reported.

This revision was proposed by the Committee on Purchasing, Simplification and Standardization of the American Hospital Association. It was developed cooperatively by representatives of the association and manufacturers of dressings and has their unanimous approval.

The recommendation establishes finished sizes, ply, construction of gauze, number per shipping case, and other details of six classes of ready-made dressings. It lists in detail the changes from the preceding issue for each class.

The recommendation was first issued in 1932 and was revised and reissued in 1938, 1947, and 1949.

Mimeographed copies of the proposed revision may be obtained from the Commodity Services Division, Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

The probable reason some people get lost in thought is because it is unfamiliar territory to them.

INDUSTRIAL BREATHING HAZARDS MADE SAFE

THE MAN WITH THE SCOTT AIR-PAK BREATHES PURE FRESH COOL AIR AT THE LOWEST OPERATING COST*

Operating a sand mill in a foundry.

Worker with Scott Air-Pak cleaning a degreaser.

In temperatures from 20° below to oven heat the Scott Air-Pak delivers cool, pure, fresh air comfortably, to meet the full needs of the wearer, regardless of the degree of exertion. Breathing is completely independent of surrounding atmospheres. The Scott Air-Pak is always ready. Takes only seconds to go into action. Ideal for industrial routine or emergency operations.

The new Scottoramic Mask gives vision unlimited — wide angle vision in all directions that helps the wearer to spot danger zones quickly for maximum safety.

**Scott Air-Paks can be refilled at a surprisingly low cost. Repair and maintenance costs are lower than other types of self-contained breathing protection equipment.*

On hazardous jobs, Scott Air-Paks help management and labor breathe easier. Send for the Booklet "Scott Air-Paks Save Money, Man Hours and Men for Industry". Write direct or ask your nearest Scott Distributor.

Celebrating a Quarter of a Century of Progress

SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

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Canada: Safety Supply Co., Toronto — Branches in principal cities

Export: Southern Oxygen Co., 15 West 57th Street, New York 19, New York

Wise Owl Club Admits Its 10,000th Member

10,000th MEMBER of Wise Owl Club, Romualdo Gallo (right) is welcomed by Pennsylvania Governor George M. Leader (left center). Witnessing ceremony are Mrs. Gallo and James E. O'Neil, director of Industrial Service, National Society for the Prevention of Blindness.

ROMUALDO GALLO, 22-year-old industrial worker from Newell, Pa., has become the 10,000th member of the Wise Owl Club of America.

Mr. Gallo qualified for membership when he saved himself from blindness by having the foresight to be wearing eye protection when an accident occurred. A native of Italy who entered the United States in 1951, he is a mechanic's helper at the Newell works of General Chemical Division, Allied Chemical and Dye Corporation.

Gov. George M. Leader of Pennsylvania enrolled Mr. Gallo on behalf of the National Society for the Prevention of Blindness, sponsor of the club. Mr. Gallo told Governor Leader that the accident in which he cheated blindness was "one of those simple things which could have become a tragedy.

"The mechanic I was helping was standing about five feet directly over me, trying to start a nut on a bolt. The nut slipped and fell straight down, directly towards my eyes. It struck the right lens of my safety goggles with enough force to shatter it, but it did not reach my eye."

Fellow employees attested to the fact that had the nut hit Gallo's naked eye, loss of sight would almost certainly have occurred.

B&O Introduces Young "Mr. Safety"

A BRIGHT-EYED year-old boy is the Baltimore and Ohio Railroad Company's "Safe Railroader of 1957."

Cherubic Jimmy Umble, the railroad's symbol for safety for 1957 is symbolic of the system's fresh approach to safety begun little more than a year ago.

Jimmy, son and grandson of B&O employees, is the promise of the future, goal of the present and dream of the past. But safety is nothing new to his family.

His grandfather, James L. Gans, a yard helper in Uniontown, Pa., was a recent safety essay contest winner. His prize: a pair of safety shoes.

Spying this smiling grandson, Mr. Gans dressed him in the newly won shoes and a railroad cap, and completed the picture with a lantern and red neckerchief.

Impressed with the picture, Mr. Gans sent it to the railroad's safety department. It, too, was impressed. G. W. Elste, safety superintendent, investigated the possibilities of using the lad in a safety promotional campaign.

Jimmy was featured in *Alert*, B&O's safety publication, and on a series of posters. Newspapers responded, especially in Connellsville, Pa., home town of the James A. Umbles (he's a B&O fireman) and their son.

The boy's infectious grin has generated enthusiasm in the railroad's safety department, too. Nine safety supervisors travel the system, checking, inspecting, instructing and approving. The department distributes such publications as *Alert*, a quarterly, family-type bulletin, and a management *Memo Book*, aimed at supervisors. Posters — both general and specific — are sent to appropriate areas. And *B&O Magazine*, in publishing safety department material, has aided the department's publicity needs.

SMILING JIMMY UMBLE is the Baltimore and Ohio Railroad Company's "Safe Railroader of 1957." The year-old son and grandson of B&O employees symbolizes the system's new approach to safety.

Miracle Quilon*-tanned safety shoes by Thom McAn protect against acids, alkalis and water

Chemox. S-4383X Mahogany.
C 7-11, D 6-12, E 6-11, EE 6-12

Chem-Hi. S-4115 Brown.
C 7-12, D 6-14, E-EEE 6-12

BOTH SHOES shown above have these outstanding advantages:

- Quilon-tanned. Protects against most strong acids, alkalis, perspiration and water, yet lets leather breathe.
- The leather will not stretch even after repeated wettings. Keeps new-looking longer, wears better.
- Oil-resistant neoprene sole and heel.
- Dacron-stitched for extra strength.
- Leather-lined steel toe box.

In addition Chem-Hi, on right, has:

- Reinforced rivets for extra strength.
- Dynel neoprene-impregnated acid-resistant laces.

Here are safety shoes made even safer by Thom McAn. We believe your men will appreciate them.

*Reg. Trade Mark. E. I. du Pont de Nemours & Co., Inc.

NOW SOLD THREE WAYS: 1. Directly from Thom McAn warehouses for plant inventory, or on mail-order basis. **2.** Through Thom McAn's special In-Plant Fitting Plan. **3.** At Thom McAn Shoe Stores. Send today for details on Thom McAn's special money-saving plans—plus a full description of the new Thom McAn Safety Shoe line. Write: Thom McAn Safety Division, 25 West 43rd Street, New York 36.

© 1957 Melville Shoe Corporation

Thom McAn
SAFETY SHOES
A Division of the Melville Shoe Corporation

Inside NSC

with Fred Lubet

Activities and people at 425 North Michigan

Tall Turkey Tale

It happened some time ago—just before Thanksgiving—but I think you'll enjoy the tall turkey tale that circulated around Council headquarters.

Probably it all started when someone innocently remarked that it would be nice if everyone got a turkey from management as a Thanksgiving present. By the usual process of wishful thinking, eavesdropping and misquoting, this remark was transformed into a rumor that everyone was getting a free Thanksgiving turkey, courtesy of NSC management.

Certain fun-loving wags on the staff, forever anxious to delude the gullible, embellished the fiction about the free turkeys. They (let them be unnamed here) said, for example, that a mistake had been made in ordering the turkeys. Instead of turkeys dressed and frozen and neatly wrapped in cellophane, live turkeys—the kind with beady eyes, sharp beaks, and scratchy claws—had been ordered.

Someone added that 400 of these extremely live turkeys had just arrived at the building loading dock, where they were kicking up much fuss and feathers, and causing the building management much consternation . . . and a considerable housekeeping problem.

Another gagster reported that he had called the local transit authority about transporting live turkeys weighing upwards of 20 pounds homeward via bus or subway. His report was discouraging: live turkeys, unless wrapped, could not be transported not even if full fare were paid. Further, he reported, the shipping room had neither experience in, nor facilities for, wrapping 400 live turkeys.

Still another wit offered the discouraging information that old-fashioned chicken stores, capable of transforming live birds into edible form (killing, defeathering, eviscerating), were virtually nonexistent in Chicago and environs, since turkeys and other forms of poultry were no longer marketed that way.

This posed the problem—for those who chose to believe the tall turkey tale—of accommodating a strong, proud, loud bird in a perhaps small apartment which also housed a wife and assorted children who wanted to associate with such fierce animals only when they (the animals) were safely in cages at the Lincoln Park Zoo.

It still isn't known whether management ever got wind of the tall turkey tale. But there was no reason to deny it: all the talk about free live turkeys, which seemed to have started at the 10 a.m. coffee break, had died out by the three p.m. coffee break. However, the NSC recreation committee raffled off—free—a flock of turkeys (dead as mackerels and frozen solid) just before Christmas.

Whether this was an aftermath of all the turkey talk of the preceding month or just a coincidence is a mystery even to me. And I'm on the recreation committee.

Renewing Your NSC Membership

I have been advised that it might be well to caution NSC members not to panic when they receive their membership renewal papers this year. The forms and papers constitute a formidable package of reading matter, and at first glance make the business of renewing your membership look as complicated as filing your income tax return.

The additional forms and papers are necessitated by adjustments which have been made in Administrative Units, the basic service in every NSC membership. Once you've read about these changes, the matter of renewing your membership is as easy as ever. Simply tell us if there has been any change in your dues basis (number of employees for industrial members) and if you desire any changes or additions in the services and publications you are receiving.

To facilitate the renewal of your membership, these suggestions are offered:

1. *Return the renewal form promptly, especially if making changes in your service.* It takes about a month to process changes in your membership service, so if you want the changes to go into effect when your new membership commences, return the form promptly.

2. *Send no money.* We prefer that you return the renewal form promptly, rather than delay it to attach a check. NSC will invoice you after your authorization to renew the service has been received and we've had an opportunity to review changes made.

3. *But take time for review.* Anxious as we are to receive your authorization to continue your service for another year, we still want you to take plenty of time to review your services for the year past and to make any changes that will improve your service in the coming year.

Would additional posters, subscriptions to NATIONAL SAFETY NEWS or *Industrial Supervisor* pep up your program?

Would a key person in your program benefit from the materials provided by an Administrative Unit subscription?

Renewal time is *the* time for all such changes. We send you a complete listing of the services you are receiving—and to save time, we suggest you make your changes right on that listing and return it to us.

is SWEEPING 3 times the job

...it should be?

Have you studied your floor maintenance costs lately? Take, for example, a simple operation like sweeping. Are you just moving dust from one spot to another? The right sweeping tool and the right brush dressing can make all the difference. Remember, 95c of each floor maintenance dollar goes for labor. That's why it pays to call in your nearby Hillyard Maintaineer® for a consultation. He'll carefully study your floor maintenance problems; recommend methods, materials and tools to do the job efficiently—and save you money!

The Hillyard Maintaineer is the man who brings Hillyard experience to your problem. He is "On Your Staff, Not Your Payroll"

FLOOR HILLYARD TREATMENT

ST. JOSEPH, MISSOURI
SAN JOSE, CALIF.
PASSAIC, N. J.

CASE HISTORY—SWEEPING

FILE III

Super Hil-Tone, Hillyard's Non-Oily Dressing, AD-SORBS dust (attracts and holds it by magnetic attraction) first to the floor, then to the brush -- then releases it cleanly when brush is shaken. No old-fashioned "blotter action" to load the brush, leave streaks, cause brush "drag".-- Gives a clean, lustrous floor in a fraction of the time. U/L approved slip-resistant. Non-darkening. Safe for any sealed surface.

SEE IF THE MAINTAINEER CAN HELP YOU!

HILLYARD St. Joseph, Mo.

Yes, I'll take you up! Without charge or obligation, have the Hillyard Maintaineer® show me how to take advantage of new streamlined floor treatment procedures.

Name_____

Institution_____

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City_____ State_____

now! you can
fight fires faster!
NEW
BUFFALO
pressurized
clear water
EXTINGUISHER
Because they're pressurized you're able to fight fires faster! Just pull the safety pin, point the hose at the base of the fire and press the lever. Instantly a 45 foot stream of water is expelled. Release the lever and the water stops. You have controlled pressure and can use the 2½ gallons of water to greater advantage.
They're lightweight too, because they are stainless steel. That means they are easier to handle, have longer life, a permanent luster and added strength.
New Buffalo pressurized clear water extinguishers are easy to recharge, just fill with water and pressurize with air or nitrogen to 125 p.s.i.
BUFFALO FIRE APPLIANCE
CORPORATION
DAYTON 1, OHIO
ESTABLISHED 1895
ORDER BUFFALO
FIRE PROTECTION FROM YOUR
INDUSTRIAL DISTRIBUTOR TODAY!
he's listed in the yellow pages
BUFFALO
better-built
the right extinguisher for every fire hazard . . . plus a complete line of brass goods and hose

Industrial Health

—From page 50

by University of California specialists in agriculture reporting plant damage observed throughout the state. Special IBM cards providing for reporting damage to 10 crops in each of four categories and to eight weeds were distributed and filled out for all parts of the state. The nature of the pollutants present could be inferred from the varieties damaged and from the nature of the damage while the mere fact of damage indicated the presence of pollution.

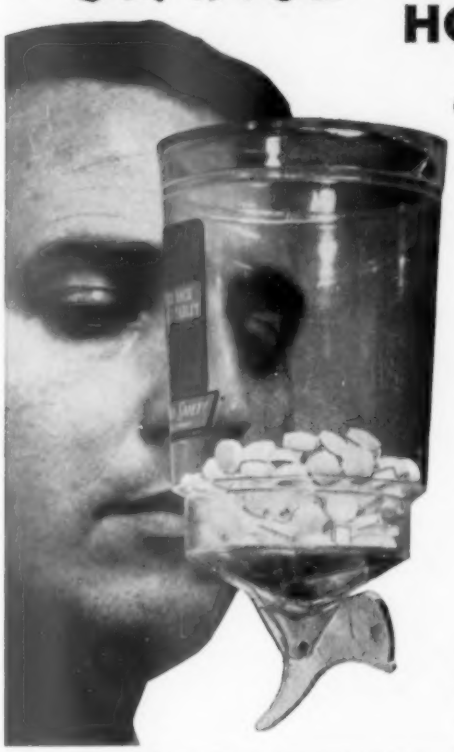
Plant damage was reported in 12 of 51 counties in the state and in all instances the areas reporting damage were those of greatest population density. The pattern of damage supports the thesis that air pollution is the result of man's total urban activities rather than of specific industrial activities.

The pollutants recognized were oxidized hydrocarbons, ethylene, and fluorides in decreasing order of importance. There were some isolated reports of sulfur dioxide toxicity due to spillage of industrial effluents. Ethylene is strictly an urban pollutant since it occurs in the products of incomplete combustion of oil and gas—either from appliances or from internal combustion engines.

A surprising observation is that there were no reports of damage typical of ozone since this has been thought to be a component of smog in both Los Angeles and San Francisco.

"Golly! They must come equipped with good brakes!"

A GLANCE AT A "CRYSTAL" TELLS YOU HOW MANY TABLETS REMAIN



and the cost is so low you discard the empties

No more unscrewing tops or shaking dispensers to see how many salt tablets remain . . . not when you have StaSafe "Crystal" dispensers.

It takes only a glance at a clear plastic "Crystal" to tell if a replacement is needed. Then putting up a new dispenser is as easy as one, two, three. 1) Slide the empty dispenser off its bracket. 2) Throw it away! 3) Slide a full "Crystal" in its place. There's no refilling and no maintenance with your "Crystal" dispensers.

Either enteric coated or impregnated tablets (at the same price) are sealed in each "Crystal" for cleanliness.

Look into "Crystals" today. They come in 500 or 1000 tablet sizes to meet your needs.

Write now for your free brochure, STASAFE SALT TABLETS AND DISPENSERS.

5% pre-season discount in addition to quantity discounts on all orders received by March 15th for shipment prior to April 1st. Put your order in now.

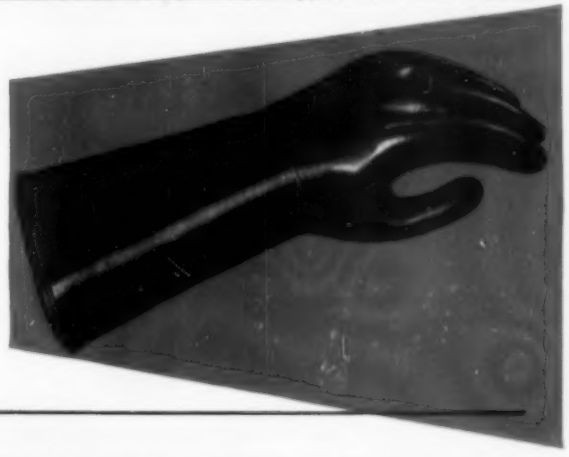
STANDARD SAFETY EQUIPMENT COMPANY
232 WEST ONTARIO STREET CHICAGO 10, ILLINOIS

NEWARK 4, N. J. 597 BROADWAY
CLEVELAND 10, OHIO 855 EAST 152nd ST.
LOS ANGELES 66, CAL. 12921 W. WASHINGTON BLVD.

HOOD GAUNTLET
with exclusive feature

No. 7703 ***Reinforced to give extra protection.*** Hood's No. 7703 gauntlet is designed for general industrial use, giving incomparable protection to workers' forearms. This gauntlet has a special thumb crotch reinforcement and a heavy bind on the 6" cuff. Industrial weight, 14½" over-all, and fully Neoprene coated.

Write today for free Hood Glove Guide—shows you how to choose the RIGHT glove for EACH job.



NEW HOOD "Grip-all" GLOVE
gives a safe, sure-grip!

No. R-60 This heavy-weight, durable glove is designed especially for workmen who handle sharp, slippery objects such as plate glass, sheet metal, etc., Coated with extra-coarse rubber dust that is super-resistant to slipping, completely flexible to allow free finger movement. In five different styles.

HOOD RUBBER CO., WATERTOWN MASS.
a division of the B. F. Goodrich Company

RUBBER • NEOPRENE • PLASTIC COATED INDUSTRIAL GLOVES

Plan now for these summertime hazards!

Salt Tablets . . . In brightly colored throw-a-way dispensers each containing, 1,000 orange, non-nauseating salt tablets. Easily fastened to wall with supplied brackets so you can establish heat fatigue stations throughout your plant and in the field.

Venex* . . . Here's complete treatment for snake bite in a compact pocket pack. Venom-extraction method so simplified, victim can treat himself. Should be one issued every field crew and in every vehicle. Available also with first aid material in new VEN-AID heavy duty pack.

Move now to make this your company's safest summer. Your Bullard distributor is ready with a complete package for Summertime Safety. Order today so factory and field areas can be equipped to meet summertime hazards!

. . . Write for free circulars on Summer Safety Protection . . . E. D. Bullard Company 275 Eighth Street, San Francisco, California

ImunOak* ImunIvy* . . . Packaged in 1 cc. vials, each vial contains 1 grain extract of oak or ivy. They are taken two or three weeks prior to first blooms of the plant in spring. Suggested dosage is 1 vial in ½ of a glass of water two or three days in succession, followed by a monthly booster during the season.

EVERYTHING BULLARD IN SAFETY

*TRADE MARKS, REG. U. S. PAT. OFFICE

TECHNICAL
FEATURE
SECTION

The Journal

OF THE
AMERICAN
SOCIETY
OF
SAFETY
ENGINEERS

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AMERICAN SOCIETY OF SAFETY ENGINEERS

Organized 1911 — Chartered 1915

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Opinions expressed in articles published in the Journal are those of the authors and are not necessarily endorsed by the Society.

WE ARE proud to report that action of the Executive Committee at its October 20 meeting admitted three new chapters to the American Society of Safety Engineers, bringing the total to 64 chapters. The new chapters, with headquarters in Little Rock, Arkansas; Albuquerque, New Mexico, and Worcester, Massachusetts, are named, respectively, the Arkansas, New Mexico and Worcester County Chapters. An up-to-date listing of all Society chapters, with headquarters cities, will be found on the inside back cover of this issue . . . October 23 another highlight of the Society year was the Annual Meeting. Arthur S. Johnson, vice president of American Mutual Liability Insurance Company, was the featured speaker and H. William Heinrich was presented with a Certificate of Honorary Membership. Texts of Mr. Johnson's paper and Mr. Heinrich's acceptance speech are published on the following pages . . . Also of note in this issue is John V. Grimaldi's analysis of research studies dealing with "Noise and Human Safety" . . . And Eugene L. Neuman's article discusses one of our Society's European counterparts, the German Association of Safety Engineers.—The Editor

Our President Speaks on SAFETY

IN YOUR activities, both professional and personal, do you show character?

Of course, "character" is a word with many formal —and several slang—definitions. But in my use of this rather overworked word I am referring to the possession of high mental and moral standards and, in addition, what one dictionary calls "notable or distinctive quality or qualities."

You, as a safety engineer, and your chapter of the American Society of Safety Engineers, as an organization of professionals in this important field of accident prevention, have a unique opportunity and a vital challenge to display this kind of character.

One incident which I observed showed something of the distinctive quality of character so valuable to a Society chapter.

I was privileged to attend a meeting of the Quebec Chapter in Montreal, Canada, and to present a Life Membership to that eminent safety statesman, Wills Maclachlan, 71 years old—or young—and still going strong for safety.

A simple ceremony at the beginning of the chapter dinner impressed me. I noticed that, as the members and guests seated themselves at the banquet tables, no one was smoking and there seemed to be an air of expectancy, of waiting for something more than the food which would be served.

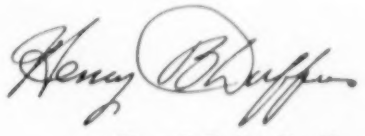
When the room was quiet the chapter general chairman, J. L. Noel, rose and proposed a toast to the Queen. This toast was followed by one to the President of the United States, out of respect for a number of guests from Canada's neighbor country.

I don't think it was my Scots inheritance that awakened my interest. To me the incident had great significance. It signified character and added a degree of dignity to the meeting. It earmarked the chapter and its environment. It established a mood especially appropriate for a meeting of a safety engineering society.

Many other chapters have practices of equivalent effectiveness. I know of a number that offer a blessing before dinner. Many open their business meetings with a prayer, as does the national Executive Committee. I hope all chapters, by their own methods, are developing similar character traits.

Certainly the opening of meetings with an expression of reverence to our leaders, both spiritual and governmental, is one positive measure to add to the natural dignity of a profession such as ours, dedicated as it is to the saving of human lives.

We must do much more, of course, to add substantially to the stature of the profession and the Society. As individuals and as chapters we must show the full development of our character by taking on, increasingly, the responsibility for accident prevention activities in our local communities. And above all we must hold fast to the principles in the Creed of the Safety Engineer and the Canons of Ethics of Engineers, which we have adopted as our guides.



Henry B. Duffus, President
American Society of Safety Engineers

A PIONEER

Honorary Member Suggests Interpretation of "Safety Engineering" Include Both Arts and Sciences of Accident Prevention

EDITOR'S NOTE: *A Certificate of Honorary Membership in the American Society of Safety Engineers was presented to H. William Heinrich (pictured at left) at the Society's Annual Meeting October 23, 1956, in the Grand Ballroom, Conrad Hilton Hotel, Chicago.*

Mr. Heinrich is the eleventh man ever to be awarded Honorary Membership, highest individual honor conferred by the Society. The certificate, which was presented by the Society's retiring national president, Edward B. Landry, reads, in part:

"In recognition of his services beyond the call of duty in the advancement of the arts and sciences of safety engineering and in the promotion of accident prevention, and as an expression of the high personal esteem in which H. William Heinrich is held by the members of the Society, we have elected him Honorary Member and have duly recorded his name on the record as such."

The acceptance speech delivered by Mr. Heinrich appears below. For a brief biography, see opposite page.

MR. PRESIDENT, officers, members and guests of the American Society of Safety Engineers, I am happy and delighted, honored and privileged to receive this evidence of respect and good fellowship. I am humble in the knowledge that you have placed me in so distinguished a group as John Roach, Daniel Harrington, Ned Dearborn, J. I. Banash, W. H. Cameron Sr., John J. V. Forbes, John Stilwell, C. H. Weiser, William P. Yant and our now departed friend, Sidney J. Williams.

Hackneyed as these expressions may be, I say them with utter conviction and the utmost sincerity, for this is not an ordinary occasion nor is the American Society of Safety Engineers an ordinary society. For me, the presentation of this Certificate of Honorary Membership in the Society is the highlight of 1956—in fact, the highlight of a lifetime.

With your permission I'd like to leave with you a thought and belief which I have long held. It relates to the future of the Society, to safety engineering and safety in all of its aspects.

The American Society of Safety Engineers is a relatively young society. So too is the safety profession itself. Yet our Society is both powerful and influential. It will grow and become even stronger and more influential. Measured as a crusade, its objectives have made remarkable progress but have barely heated the crucible of achievement.

My thought is that the concept of safety and that of our Society should be broader both in thinking and in action—broad to the point that safety becomes recognized as a distinctive profession, one comparable in publicly acknowledged achievement to medicine. Medicine, to be sure, deals with both prevention and cure but the emphasis in practice is largely on cure. Safety deals primarily with *prevention*. Nothing could be more important, more non-controversial than the prevention of accidents and of the deaths and injuries, the pain, grief and economic losses that accidents cause. The field in safety is wide open to the highest degree of research—technical research and that which deals with psychology.

Made Up of Safety Professionals

The American Society of Safety Engineers is more than a luncheon club, more than a group of persons who get together to share experiences and more than a gathering of persons who are merely *interested* in safety. Our Society is composed of people *who are actually and directly practicing the profession of safety.*

There is a great need for safety councils with their broad representation but there is even greater need for the "doers," the men and women who *practice* safety as well as preach it and who do their best to encourage others to think and to act in the interests of humanity and economy.

Our Society by name and by its constitution and bylaws has cheerfully accepted a tremendous national responsibility. There is no other comparable organization. The American Society of Safety Engineers of the near future, as I visualize it, will be the Mecca, the clearing house, the central source of information, of facts and of advice to all persons and groups concerned with the prevention of accidents. It will be looked to for constructive criticism and suggestions with regard to safety aspects in the design, construction, installation, inspection, operation and maintenance of structures, machines, tools, equipment, processes and procedures. It will be

LOOKS AHEAD

by H. William Heinrich

recognized as the source of factual data on both the unsafe personal attitudes and unsafe practices that permit or cause accidents, and on the most effective factors in safety organization, in management and supervision and in safety education and training.

Work of the nature herein described will not conflict with, but will aid, that of safety councils and other organizations because it *will be primarily technical.*

The gathering and dissemination of general data will be a natural corollary, of course, but promotional activity will be carried on in cooperation with organizations which have this as a major objective.

Goes Beyond Exact Sciences

As a registered professional mechanical engineer, I am proud to claim even a lowly share of association with so distinguished a group. As a matter of fact the safety field in which I am happy to be presently engaged, as chairman of the Uniform Boiler and Pressure Vessel Laws Society, is primarily one that deals with American Society of Mechanical Engineers code construction, which in turn features design, factors of safety and the quality and strength of materials. However, I see in safety an even greater opportunity. There is more, much more to safety than is encompassed in mechanical engineering—more than in chemical, electrical and civil engineering—more than in traffic, industrial management, construction, manufacturing, mining, agriculture and the home. The great residue, stated separately, lies in the education and training and finally *the control of unsafe personal* performance.

The American Society of Safety Engineers does not need to change its name but just to define it—and to broaden its concept of and application to the safety engineering profession.

The term "engineering" is already broadly defined in usage. A well planned and well conducted task is said to be "well engineered." The term "human engineering" is in common use.

Advocates Activity in Many Fields

So be it, my thought visualizes printed and spoken references to aspects of safety beyond mechanical engineering, and especially to *human* engineering. I see even a note or subtitle, a foreword and a heading on stationery, on bill heads and publicity material, that ties in human engineering with our Society. And I visualize, too, the formation of Society sections and committees of size that specialize in research and action, within the greater Society, on mechanical safety engineering, on the other sciences and arts and on the control of unsafe personal performance.

The members of the American Society of Safety Engineers carry on a distinguished and distinctive profession. The time is near when that profession will be so recognized nationally. An educational background is needed; I foresee the development of a special undergraduate curriculum leading to the degree of bachelor of science in safety and post-graduate progress to both master's and doctor's degrees.

In conclusion, may I again express from the heart my thanks to Retiring President Edward B. Landry, to the Executive Committee and to all members of the Society. And may I offer my sincere best wishes to our incoming president and officers and to the American Society of Safety Engineers for its continued growth and prosperity.

BIOGRAPHICAL NOTES: *H. William Heinrich is chairman of the Uniform Boiler and Pressure Vessel Laws Society Inc., a position he has held since his retirement in mid-1956 as superintendent of the Engineering and Loss Control Division, Travelers Insurance Company. He had been employed by Travelers since 1913.*

Mr. Heinrich has been a member of the American Society of Safety Engineers since 1924 and has been active in the affairs of the Society, serving for a number of years on the national Executive Committee and as chairman of several Standing Committees. In 1955 he was elected to a three year term on the Executive Committee as a national member-at-large. He is a member of the Society's Connecticut Valley Chapter.

Widely known for his research in the field of accident prevention, Mr. Heinrich is the author of four books and many magazine articles, including "The Accident Cause Ratio—88:10:2," which was published in the May, 1956, issue of the Journal of the American Society of Safety Engineers.

He has served as chairman and member of committees of the American Standards Association, has participated in many conferences and holds membership in a number of organizations, including the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, Veterans of Safety and the Casualty Council of Underwriters' Laboratories.

In 1952 Mr. Heinrich received two outstanding honors for his contributions to the safety movement, the Arthur Williams Memorial Medal from the American Museum of Safety and the Medal of the Conservatoire Nationale des Arts Et Metiers, *Paris.*

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by

Arthur S. Johnson

Speaker Challenges Society Members To Advance Knowledge and Understanding in Areas of Exact and Social Sciences

STANDARDS of CONCERN to the SAFETY ENGINEER

EDITOR'S NOTE: *Principal speaker at the 1956 Annual Meeting of the American Society of Safety Engineers (held October 23 in the Grand Ballroom, Conrad Hilton Hotel, Chicago) was Arthur S. Johnson, vice president, Engineering, American Mutual Liability Insurance Company. The text of his address to the Society membership is published on the following pages.*

Mr. Johnson has been with American Mutual for more than 30 years and has a long and distinguished record of participation in safety activities. He serves as chairman of the American Standards Council, governing body of the American Standards Association, and is a member of the National Safety Council's Industrial and Traffic and Transportation Conferences and the National Association of Manufacturers' Health and Safety Committee.

THE American Society of Safety Engineers faces one of the most compelling challenges that can motivate any group of leaders in organized society. That challenge is to provide the engineering know-how and technique with which to operate the safety movement in the United States. The pressure comes from the cold, unvarnished and tragic fact that even in the year 1956 the annual price in death and injury for our American way of life is 90,000 dead.

Whether the challenge is a primary one or corollary to a more fundamental one, I am not sure. I think it is corollary. The more fundamental challenge is the American way of life itself, which we find easy to take for granted. Out of our comfortable and quite desirable high standard of living, either by ignorance, thoughtlessness, callousness or merely the lack of voluntary control, come these accidents.

Seeks Measurement of Success

Where are the criteria to be found which measure safety engineering accomplishment? We are not dealing here with engineering standards of dimensions or tests or safety codes. If I can justify taking your time to consider your own measures of objectives and methods and satisfactions, it must be to discuss them within the frameworks that provide the natural yardsticks. Let us examine control and see where that leads us.

Control has come to be a key word in our American language. We organize ourselves into every conceivable sort of society, collectively to control something. The word connotes many things. It carries more meaning of attaining an objective than of stopping something. Control generally means the procedure within a plan to achieve a result, together with the review and feedback to assure continuance of the plan. Control is used to describe actions that vary in acceptability all the way from "to be rebelled against" to "very desirable and much sought for." There is acceptance of the control of the sale of football tickets, but one reacts to the control implied by "police state."

The American miracle may be that we are achieving civilization by organized voluntary control more outside of government than within it, knowing that it couldn't possibly be attained under formal government controls alone.

Calls Safety Production Key

By mid-Twentieth Century in the United States the principles of production and distribution have succeeded in bringing us to such a high order of living, with the Bill of Rights still untrammelled, that control can be discussed objectively and in the public interest without suspicion of skullduggery or selfish motive. Thus the safety engineer can seek to put engineering methods into accident prevention realizing that safety is the biggest single control— still imperfect in its design and application—upon which the realization of the good things in American life depends. Never fail to remember that safety is not implicit in an automobile, lawnmower, frozen food, Colt revolver, etc., nor in their manufacture. Hazard is implicit in the manufacture and the use of each of these things. It is control that makes them safely and makes them safe to use.

And for these reasons I will try to bring your mind this morning to "Standards," the limit to which controls are integrated.

A standard is the criterion which measures the adopted way of doing something. It is "Standard" with a capital "S" when it is recognized by representative groups as the "best known way." Someone applies the yardstick and reads the measure. When the reading is within the tolerance permitted by the standard a good result is declared; the standard has been met. Let us then search out some standard, of interest to safety engineers, which can be used to evaluate their accomplishments when accomplishment may lie anywhere between "very ordinary" and "maximum usefulness."

In order that this might be more a report of an analysis, or better still, a reflection of your own opinions, I have put some questions to a couple of dozen first class safety engineers to see how standards stacked up in their minds. I am persuaded that among any number of frameworks with which safety engineering and accident prevention actions of all kinds might be placed, there are four which provide the important criteria. It will be my purpose to enumerate the four areas, discuss the nature of the standards which may be drawn from each and make some recommendations to the safety engineering profession generally and to the American Society of Safety Engineers, as its seat of voluntary control, in particular.

Names 4 Major Areas

The four areas of activity that subtend the safety engineer's objectives, actions and accomplishments seem to be:

1. The technical; that is, the factual, physical, transfer-of-energy area, limited by knowledge of the laws of nature reduced to their mathematical abstractions and expanded into the wealth-creating schemes that we call our industrial economy. That is a very large area, but it is the engineer's natural stamping ground and he understands its language.

2. The human relations area dealing with behavior of people toward each other. This is perhaps the most important to the engineer, because the purpose of all actions taken in the technical field is somehow or other for the benefit of people. Let us not be concerned in this discussion with the benefits that industry seeks, but limit our present interest in this area to providing a framework of human relationships and methods for their evaluation.

3. The intellectual, or the area of human endeavor that seeks knowledge for the vast array of benefits to be realized by culture in its broadest sense. I separate this from human relations as a whole area, not as a corollary, because knowledge as such—and the communication of ideas that spring from knowledge—as opposed to the display of reaction based upon inherited tendency or instinct, may be the means of differentiating between the useful man and the "warm body."

4. The spiritual, that vast area of human behavior and hope which marks the civilized man from the barbarian.

Reviews Technical Progress

Lest someone mistake my purpose for what may seem to be dragging some non-specific and non-concrete consideration into an engineer's job, which primarily translates ideas to things, let me hasten to assert that unless the material good qualities of the American scheme reveal the spiritual plane upon which all this adventure takes place, then surely the safety movement is crying in the wilderness.

Now let us take up, one at a time, these four areas of interest and search out the principles that underlie the standards.

In taking up the technical area, let us ask ourselves a question and explore it. "How are we doing?"

The safety movement as such is 50 years old and most of the significant results have come since the first World War. In that time accidents in occupations have been cut in half at least twice and in some industries as much as three times. The rate of producing highway accidents seems to have been cut. I don't know how much, but death rates have come down one-half, twice in 20 years. But—the gross national product has doubled twice, in dollar measures, since the depression. Real wages have doubled in 50 years when historically they have doubled in 300 years.

So we are compelled to ask ourselves, "Did the accident reduction come about through the actions of safety engineers in their staff positions, trying to engineer safety into jobs and to teach safe practices to people, or did the vastly increasing intelligence of management—in creating new and better ways of producing all our goods—include safer methods as a natural consequence?"

Credits Safety Engineers

Being an engineer I hasten to express my view that safety engineering did contribute its fair share toward the result, for I have examined dozens and dozens of situations in which the safety engineer provided the spark that made management pursue a safety course first that led to more profitable and better production later. The law of industrial safety supports this view; namely, that operating efficiency does not reach maximum until accidents have been reduced to minimum.

In the meantime things are happening. The rate at which mechanical aids will be added to man's usefulness to work, to produce and to manage to control production, beggar the imagination. There will be general acceptance when the benefits are revealed. There are already operating in industry jobs that are so complex and the setup so costly that the combined skill of the designing engineers, the industrial engineers, the production engineers, the safety engineers, the management from top to bottom and the workmen thrown in for good measure cannot predict with certainty that some given number of operations can be completed without accident. Yet the compelling objective from this day forth must be:

1. To visualize hazard and the means of an accident.
2. To predict successful operation with certainty.
3. To design the worker contribution to each task so as to fall within the physiological limits of the worker.
4. To establish "fail safe" controls.
5. To train hands to the degree that each understands his routine including what to do in every emergency and to make certain each understands the consequences of an accident.

Sees Need for Engineering

Let me charge one variety of safety engineer with a growing tendency to forget his real objectives. Too many are piddling with contests and accident records quarrels, settling for a safety committee meeting or a routine plant inspection, trying every means at their disposal to reduce the score of accidents except by engineering so that there will not be accidents. *Contribute your proper share of engineering skill to make operations safe or quit claiming to be engineers.*

The positive action called for from this day forth is best described by T. F. Hatch, in the spring of 1956 before the Western Pennsylvania Safety Conference (and elsewhere in the literature). His address on coordinating the human and mechanical factors in safety engineering is an important contribution to the current safety literature.

The principle which underlies engineering attention to any task is the principle of discipline. A task in any undertaking—casting an engine block, driving an automobile, operating a crane, providing the human factors in an otherwise automatic operation, anything—is subject to analysis and description. Every motion can be accounted for. The total of the actions define the routine or discipline for the task. The *discovery of the possibility of causing an accident* in each coordinated set of actions, machine and person, and changing the relative motions to remove the accident possibility, is the first step in safety engineering. The standard of performance which I recommend has three parts:

1. Understand the principles of mechanics that are involved.
2. Examine with understanding to the end that you approve each job instruction.
3. Demonstrate each faulty condition so that the job designer—either machine or task—can make the change you suggest.

This is *accident control* through *safety engineering* with *standards.*

If you think I am setting too high a standard, then you set a lower one that does not at the same time transfer the safety engineer's function to someone else. If it is so transferred you have worked yourself out of a job.

Tells Value of Human Relations

Let us now turn our attention to the area of human relations to see what standards principle that framework holds for the safety engineer. We must recognize that the second half of the safety engineer's job is to communicate his thoughts to others. Since he is discovering things that others are not aware of and trying to get right and willing action for the things he sponsors, he is essentially a teacher. His job is one of staff to the production line and to all the production and engineering staffs. Even in highway safety he is counselor to the citizen who is deciding where, when and how to drive his car.

It would seem that the job of communicating his ideas to others is simple. However, it is not. We are living in an age when people often do not heed what they are told, and the tendency seems to be to put the burden upon the teller rather than the listener. Getting along with people has taken the prominent place in the minds of industrial management and personality seems to be a more prominent topic of conversation among personnel directors and consulting psychologists than technical know-how.

Let this point be clear. If you are an engineer, there is no substitute for knowing what you are talking about. At the same time, any one of a half dozen unfavorable behavior patterns can and does effectively nullify all effort to communicate an idea and get right action. For example, the egotistical fathead and the immature, subjective, defensive person are not useful. While it is an engineer's natural inclination to be intolerant of people who have to be approached with baby talk and "pretty please," the fact remains that the engineer by his very breeding and his staff position has to put a premium upon his good relations with others. His natural operating policy of "I suit me," makes it imperative that he establish for himself an outgiving code of communication.

The principle that underlies satisfactory human relations is the principle of equal dignity. Ability to understand, intelligence, experience, education, technical visualization, etc., will vary but standards of communication between the safety engineer and all his pupils, from president to lowest grade of worker, will be proper if founded on the principle of equal dignity. In this connection, the job analyst task which I recommended in the chapter on technical activity is, in part, one of coordination between the various engineers, the personnel specialists and the psychologists. You better not start it if you can't control the personal equation.

Shows Importance of Education

Let me turn to the framework provided by intellectual considerations. It is classical to find fault with engineers of all kinds for their limited range of interests, especially those lacking an interest to acquire a better working skill in English. As a matter of fact I doubt such a limit. Introversion yes, but not lack of interests. It is also pointed out that the persons with strong aptitudes for executive management also exhibit the largest vocabularies, while many engineers appear to be inarticulate.

I have no intention of pursuing a course of criticism of my many friends who make up the profession in which I am placed and of which I am very proud. But I do wish to sound a note of warning that even now may be coming too late for some people. No longer is it possible to meet new situations off-the-cuff of one's own experience. Industries are sending executives and foremen to school, not just to learn the tools of management and the new techniques of production, but to broaden themselves especially in English and mathematics and in any other subject that is interesting to the individual and provides study disciplines.

It is proving to be necessary to do this in order to understand Twentieth Century methods and culture. It is providing the control by which people can listen with recognition and a capacity to absorb. Almost all the basic knowledge of natural functions that has been discovered has been reduced to mathematical abstractions and is on its way to industrial usefulness.

The crying need today is more basic knowledge to feed the insatiable appetite of the American people for more ease and comfort and culture. The search for new knowledge is in ferment in every university, foundation and research laboratory. The engineer will provide the trained mind that codifies the new knowledge into useful activities. The safety engineer must make certain that the opportunity for mistakes does not provide the accidents which injure or destroy. Hence for the safety engineer there is no recourse but to extend constantly his own cultural disciplines.

I do not refer to subscribing to the primers which tell the success stories of accidents prevented. Safety literature as it is now published offers no mental exercise to the safety engineer. What is needed are stimuli to intellectual pursuits for their own sakes, before we find ourselves unable to do anything but piddle with accident records and such trivia.

What is the standard in this area? That is hard to set down. During the early guarding-of-machinery days, say up to 1930, there were a great many good safety men who came from millwright and other shop supervision jobs. Those who have survived to now and are able to meet executive management face to face have improved the breadth of their learning to the equivalence of experienced, graduate engineers. They earn good salaries. Some of them continue to be the best in the business. Since the depression and the war, the standard of selection has risen to engineering graduate for admission to the profession, green, without experience.

While it is true that presently the research and production markets cannot find all the advanced graduate engineers they need, I hope to live to see the day when PhD's will find a challenge to their talents in safety engineering. Safety engineers are a dedicated crowd of humanists, and learned men with such lofty objectives can be happy in its activities. For the present generation, to whom more book disciplines might be difficult, I would say teach, read, study—formally or otherwise as best you are able—but do not stop learning things that are new to you.

Stresses Spiritual Dedication

Let us now explore briefly the spiritual area in which we will find the truly purposeful standards. Earlier I spoke of the acceptability of controls as those which were in the public interest as opposed to those that are essentially in support of selfishness. Selfishness is of course a quality of the spirit that motivates many actions. It is not one that is to be classed in the affirmative as providing benefit to all. To the safety engineer, spiritual values are truly objectives.

If a control leads to serenity, it is right. Without serenity, material benefits are as dust in the mouth. If the control leads to charity or compassion or tolerance, it is right. Courtesy as an artificial relationship between people is like armed peace—without trust. Courtesy which is the result of obedience to the truly spiritual motives of charity—compassion and tolerance, then self discipline, self control—reaches its highest standard. I am convinced that the material good things in our American scheme will carry us naturally to a higher spiritual plane; the hangover of viciousness in its various forms, requiring punitive controls, is a relic of barbarism.

There are no people who are dealing with the full range of practical and material things, whose actions are more motivated by humane objectives than safety engineers. It is in the humane objectives that they find the dedication which so strikingly marks some of them. The standards of performance that are truly significant are on the spiritual plane.

Now, briefly and in conclusion, permit me to recommend some things for your Society to ponder and take action on.

1. Find a way to give significance to your Committee on Research. Presently it appears to me that researchers in safety are happy with the discovery of a gadget. The engineering problem that research should be concerned with is the filling of the gaps of knowledge, and then communicating the new knowledge. Safety engineers need desperately the comprehension of the scientific and human facts coming into new use in industry. But they need that knowledge in advance of utilization having reduced it to handbook treatment.
2. Become a Safety Standards agency. In an earlier address I made this recommendation, and you already have made standardization an operating policy. I am not repeating now to be critical of your policy. I am critical of your performance. Lead—take the initiative—build a fire under this activity so that your Committe on Safety Standards may be inspired to seek the best way in all you future actions. You should continue to process your Standards program in the procedure of the American Standards Association, of course.
3. Examine your educational objectives and processes. To the extent that I understand them, they do not seek to make the most of safety engineering either as a chore in the plants or as a profession. I think they can try to inject a modicum of safety into all engineering. That is all well and good, but you should not permit a modicum for yourselves or your society.
4. Coordination of all interested parties and their action is the foundation of management. Coordinated action to bring about safety for all people is the final tactical plan of all the breeds of engineering involved, medical, physical and personal professions together with management as the coordinating influence. This is accomplished under the staff planning and direction of the safety engineer. In some companies the safety engineer has been made subordinate to others who do not know accident prevention. This may reveal professional weakness that can be overcome only by raising the professional skill and level of the safety man. Let there be a raising of the sights to the horizons that encompass the whole safety problem and envision the full scope of the accident prevention method. My recommendation is to do it informally by such as this address, and formally by committees to study all your excuses for existence and improve them.

Charts Course for Society

In this address I have undertaken to report to you how some responsible safety engineers look upon standards as applied to themselves and to their own performance. I have of course enlarged upon their views in an effort to give you, as the professional society of safety engineers, some notion of the direction toward which your problems will lead you in the predictable future and what your actions should be to become sufficiently capable to meet the problems at levels of performance that justify the concept of "Standard."

Yours is a noble cause and your standards are necessarily on a high spiritual plane. Living on a spiritual plane will always provide all the adventure and danger that you can plan for and control.

Review of Studies Shows Noise Effect on Communications, Psychological Factors Establishes Relationship between . . .

NOISE and Human Safety

by John V. Grimaldi

RECENT health and safety literature has pointed up the possibility that exposure to certain sound pressures can result in hearing loss. Although the clinical and experimental evidence is clear concerning the possibilites, there are many complicating variables. These have been described and should be familiar to all who have given some study to the matter. There may be other ramifications of the noise and safety relationship, however, which may be greater in extent, if not in significance, than those immediately concerned with the loss of hearing. For example, communications interference and psychological effects have been identified with the noise-safety problem.

Noise and Hearing Losses

Perhaps it would be worthwhile to review first the variables complicating the hearing loss problem as the first step in examining the noise-human safety relationship and the uncertainties surrounding it.

Aging is responsible for some of the difficulty. It is presumed that the deterioration of hearing among certain older people is a part of the aging process. But it has also been surmised[1] that the noises of everyday life may be accountable.

Temporary losses are another complication. It has been observed[1,2,3] that measured hearing losses associated with noisy environments may be improved following removal from the noise source. The recovery may continue for as long as six months to a year and raises the question of whether the hearing losses reported related to noise may have followed measurements of defects that would have dissipated somewhat with rest.

Related effects of noise frequency and intensity must be considered. The identification of a noise merely in terms of its sound pressure level will not necessarily indicate the possible damaging effects of the noise. Early investigators reported only the noise level for the environment under study, without indicating the weighting network or reference pressure used. The usual sound-level meters indicate the sum of the sound pressures* over the range of sound frequencies. Therefore, for a noise having present all audible frequencies at equal sound pressure levels, the overall sound pressure level may be considerably higher than for any one frequency band of the noise. Further, there is increasing acceptance that the disturbing effects of noise may be expected to vary directly with both intensity and frequency.[1,4,5,6]

The preventionist, trying to identify the noise-hearing loss factors and their degree of involvement, has even more to consider. The procedure used and the conditions present when evaluating the noisy environment or the hearing loss of the individual might give improper results. On the other hand, illness may be responsible for hearing loss resembling that which may be caused by noise.[7] It is possible, too, that the noise situation in the shop may vary over the years as processes are changed and machines replaced. Also, individual susceptibility to hearing loss due to noise varies. False conclusions, therefore, may be derived.

The complications are heightened when consideration is given the attempts to establish criteria for hearing damage. Sterner[6] conducted an interesting questionnaire study of 275 professionals concerned with establishing a safe-limit for noise levels. The replies recommended maximum levels ranging from approximately 60 to 105 decibels. An interesting indication of the spread of opinion is seen in the reproduction of Sterner's plot of the replies, Figure 1. A recent authoritative report[8] indicates that noise levels between 90 and 100 db, particularly in the speech frequencies, should be the limit for continuous exposures, to prevent hearing damage.

Speech Interference

The masking effect that noise has on communication can be another, but different, safety problem. Inability to understand instructions or working signals in noisy places aggravates hazardous situations and may otherwise reduce efficient performance. There are a number of methods for indicating the sound level at which voice

**The American Standard for Sound-Level Meters specifies that the instrument be designed with three frequency response characteristics, which are obtained by "weighting" networks, designated A, B, C and also known as "40 db," "70 db" and "flat," respectively. It is when the flat frequency response is used that a meter measures "sound pressure levels." When measurements are made with the weighting networks, the meter is said to register sound levels. The accepted reference pressure is 0.0002 dyne/sq. cm.*

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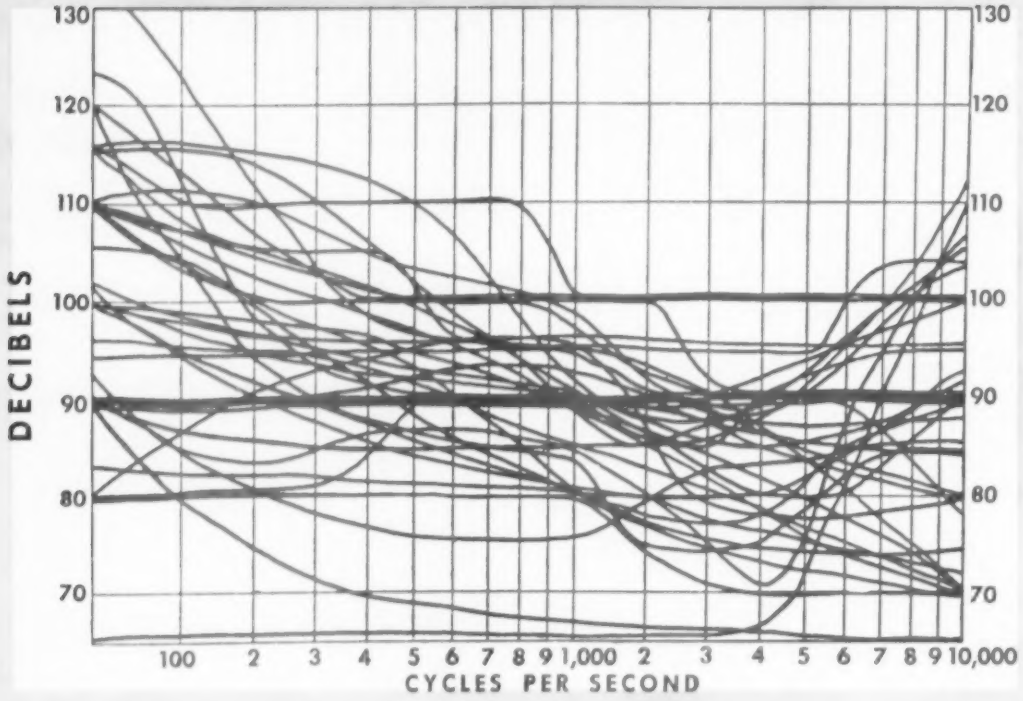

Figure 1—Estimates of "Safe" Frequency-Intensity Levels

NOISE AND HUMAN SAFETY *Continued*

communication becomes difficult. One[9] is frequently used in engineering problems. In this method the sound pressure noise level is determined in the frequency bands: 600-1200, 1200-2400 and 2400-4800 cycles, using an octave band analyzer and sound level meter. The arithmetic average for the three levels is then computed. This average is known as the "speech interference level" and is expressed in db, re: 0.0002 dyne/sq. cm. Figure 2,[10] is a table indicating the maximum speech interference level for a listener at various distances from the voice source.

A noise level above 89 db would make a *shouted* conversation difficult across a distance of six inches from the listener. This level, then, would be the maximum tolerable if voice communication were to be accomplished. It is interesting to consider that 89 db—the maximum speech interference level—is close to the suggested level for hearing damage prevention. In other words, a noisy environment that is controlled with respect to the needs for voice communication will not be apt to cause hearing losses.

Psychological Effects

It is probable that noise has some psychological influence on man and that there may be some relationship to safe performance. Many studies have been made to explore the general area of psychological effects attributable to noise, but most have been poorly controlled, resulting in questionable data.[11, 12]

Control Problem

There is always a problem when constructing an experiment which is intended to explore the influence of a certain factor—for example, noise—on the behavior of people. Since the experiment generally is of short duration and uses a small sampling of the population, extraneous factors may contaminate the data unless there are proper controls. For example, such factors as the following should be considered for delimitation: humidity, illumination, age, physical letdown or the feeling of not being able to perform at one's best, hearing acuity, vision acuity, learning, experience, capacity and status. The usual uncertainty that is associated with the results of experiments concerned with behavior, therefore, must be greater. Nevertheless, the principal studies are of interest and do have value as markers along the road to our eventual understanding of the noise-behavior relation.

An early investigation[13, 14] was concerned with the work performance of weavers. The looms created a noise level of about 96 db.* The experiments first had

**In this and many other studies, the reference level for db is not expressed, but it seems likely that 0.0002 dyne/sq. cm. was used.*

a group of weavers wear ear plugs on alternate weeks, which reduced the intensity 10 to 15 db during those periods; then the weavers were divided into two groups of ten, equated according to past efficiency, and one group wore ear plugs while working for six months. The other group serving as a control did not; finally, the second experiment was repeated using some different subjects but extended over a period of one year. The results of the three experiments were roughly the same, indicating approximately a 12 per cent average increase in efficiency for those who wore the ear plugs.

Unanswered Questions

However, the results raise questions which can not be answered by examination of the experimental technique. For example, as the experiment was ending, the results of the experimental and control groups came closer together. It might be surmised that this was because the motivation or added interest from being a subject began to wane, affecting the production results. Indeed, the subjective reports of some of the subjects indicate an approval of the experiment and an interest in helping its progress. It has been shown[15] that such attitudes can significantly affect work output. A criticism reported in the literature[16] noted that the equality of the experimental and control groups in the first and second experiments was never demonstrated. The first experiment's results were suspected also by the investigators because of a difference in humidity between the weeks worked with ear plugs and when ear plugs were not worn.

The principal field study done in America has never been published in its entirety, but representative reports have appeared in several places.[17, 18, 19] Semi-monthly records of bonus awards to typists, clerical checkers, punchcard and comptometer operators were kept by the Aetna Insurance Company for one year prior to and one year after the offices were treated with sound absorbing materials. Initially the sound levels were about 41 db, and 35 db after the treatment. The results stated were a 52 per cent reduction in calculating machine operators' errors, 29 per cent reduction in typists' errors, employe turnover reduced by 47 per cent and a "health improvement" of 37.5 per cent.

Due to a scarceness of pertinent facts it is difficult to criticize this study, but the results appear to be extraordinary if attributable to sound reduction alone. One wonders whether in the two years allowed for the study there may not have been some improved worker efficiency through learning, the deficient may have been discharged or transferred, the quality of supervision may have improved, and so on.

Inconclusive Results

The results are somewhat deemphasized by a control study made a year later. The sound absorbing media were covered with gypsum board, raising the noise level six db. It was found immediately thereafter that the bonus efficiency dropped to some extent, but not as low as the first year. However, within two months it was as high as for the "quiet" year.

One study[20] reported the effect of a distracting noise upon reaction time to various stimuli. For noise, an anvil was struck by a hammer and the noise was present (a) continuously during both reaction and rest periods for one series of tests; (b) continuously, but only during the reaction periods for another series; (c) intermittently, but only during the reactions for a third series. The results showed the distractor may lengthen and also shorten the reaction or it may become habitual and have no effect at all; its effect is dependent upon the conscious attitude of the subject during the distraction and "upon the temporal relations of the distractor;" it is most resistant to habituation when intermittent.

Analyzing this study, there seems to have been no attempt to control the experiment with regard to the other variables that may have had an effect on its results, namely temperature, humidity and the feeling of fatigue or lassitude. This study is typical of most of the early studies[21, 22, 23] on the effects of noise in that it deals with reaction time.

One study[24] investigated the effect of the steadiness and pitch of a noise stimulus on a coordination task. An "experimental factory" was established employing four workers, two at a time, who inserted an electric stylus in the holes of a moving tape and contacted a conducting plate. The holes were small, irregularly shaped and spaced. Performance was recorded by electric counters, while the "workers" did their task under conditions of frequency variations from 64 cps to 4096 cps and noise levels from 50 db to 70 db. The work period was four and one-half hours each day and lasted three months.

Noise, Performance Variations

Individual results or daily records were not presented, but it is stated that data for days that were "humid" or "hot" and "when one of the subjects felt indisposed" were not included. It was found that complex, steady noises had a more adverse effect on the "production" performance than pure tones of equal intensity, with the exception of tones above 2048 cps. From 512 cps upward, each increase in frequency preceded a further loss in production. Further, the more intense the noise, the greater the initial decrease in performance. Reduction in noise levels was followed by increase in output, with a greater gain noticed for reductions from the more intense levels. An intensity drop of five per cent from 70 db was followed by a three per cent reduction in errors.

It was stated that as a precaution against the subjects not being accustomed to the noise, the results for the louder noises were gathered last in the course of the experiment. This procedure may be considered to impugn the results, for it is likely that a subject's motivation can well decrease during the run of a three month experiment.

A later investigation[25] was reported, concerning the effect of diverse atmospheric and noise conditions upon output, feelings and physiological functions during the performance of various tasks roughly analagous to operations found in the plotting and charting rooms of naval vessels. Six subjects were chosen to meet the physical requirements of the U.S. Navy and for homogenous grouping with regard to age, education and general intelligence. The noise source was an electric ventilator fan developing noise levels of 72, 80 and 90 db. A relatively large group of experimental tests were used (i.e., discrimeter, mental multiplication, number checking, type-

writer code test, locations test, pursuit and attitudes tests, pulse rate and oral temperatures, and the Hull Engine Lathe Test).

The study would seem to have been well controlled and its results, which showed that performance of the tasks employed were not adversely affected, are acceptable if one does not question the unfortunately small sample. The study, however, did not consider the effect of, nor report the frequencies of, the noises used. This limits the value of the information in the light of present suspicions concerning the possible influences of noise frequency as well as intensity.

Aircraft Noise Tests

Tests conducted with "military" noises to determine their effect on psychomotor efficiency were carried out during World War II. A study[26, 27] simulated aircraft noise, and its spectra (frequency range) and intensity were measured. Five subjects, for seven hours per day, four days a week through four weeks, performed various tasks requiring decision and coordination under conditions of "quiet" and "noise," and their performance and reaction time were recorded.

The results of one of the tests showed there was a slower average response time and errors were more numerous in the presence of noise. However, in general there seemed to be no difference in performance for the tests conducted in the noisy vs. the quiet condition. It was noted that the "quiet" condition for some of the experiments was noisier than the "noise" condition for many other of the experiments performed. This may or may not have had a significant effect on the results.

Part III of a report edited by Waring[28] reviewed this study and divided the results into those that gave inconclusive results and those that showed no effect from noise. It was concluded from the review that airplane noise has no or, at the worst, but slight detrimental effect upon motor coordination, reaction time, sensory perceptions and certain mental functions even after exposures lasting several hours. However, all the subjects reported they preferred "quiet" and tended to feel fatigued and irritable after working in "noisy" surroundings.

Another experiment,[29] paralleling a military situation, examined the effects of loud sounds on the accuracy of azimuth tracking and stereoscopic range finding with a device for gunfire control. Subjects were exposed to phonograph recordings of such sounds as air raid sirens, exploding bombs and airplanes. The results showed that, in general, noise did not affect performance. Although in one of the tests noise adversely disturbed performance, subjects adapted themselves fairly promptly. This may have been due to the fact that the nature of the test task was automatized.

One recent interesting study[30] did not investigate the relationship between noise and neuro-muscular performance. A sample group of 35 college students and a control group of 34 were administered number checking, name checking and form board tests. Subjects were motivated by cash prizes to achieve productivity. The scoring method heavily penalized a "hit or miss" performance. The 10 best scores received the largest cash prizes. The experimental group was subjected to a noise stimulus having a level of 100 $\pm$ 2 db and whose spectrum ranged from 100 cps to 3000 cps, except for a rise of 7 db in the region of 150-300 cps, and 4 db in the region of 2500 cps. The experiment consumed 30 minutes for each group, with the period of quiet equal to the period of noise during the noise condition. The experimental sound was the thermal noise of a continuously conducting gas triode, fed to an amplifier and heard through two loud speakers. Bursts of sound ranged in length from 10 to 50 seconds.

The results, although not immediately pertinent to the study under consideration in this report, showed that the effect, upon short term mental performance, of bursts of intense noise is to increase the quantity and decrease the quality of response; but the effects were of such magnitude as to be practically negligible. It would have been interesting if the experimenter had attempted to determine whether there were any comparative differences in response at varying sound levels and frequency ranges. Apparently the study was not delimited to subjects with normal hearing.

A recent investigation described in a British report[31] employed a series of steam pressure gauges lined along three sides of a square. The subject stood in the center of the open end of the square and was instructed to observe and correct any pointer which exceeded the danger mark. The pointer signals were presented at random and the test runs were 90 minutes long. Ten subjects participated, each for five days, and were exposed in the sequence—quiet, quiet, noise, noise, quiet. Noise levels for quiet were 70 db, and noise 100 db re: 0.0002 dyne/sq. cm. The results indicated that subjects performed more poorly (about 33 per cent) on the noise days than on the quiet days preceding and following. When the task was made simpler (the dials were replaced by lights whose brilliance was sharply intensified at random as a signal) another group of ten subjects showed no significant effect of noise.

Biological Effects Survey

Recently a study team of scientists cooperated in a program to survey existing information on the biological effects of noise and to conduct preliminary experiments. Their work has been published in a document identified as the "Benox Report"[32] which covers physiological and psychological aspects of the problem.

One member of the team reported on a series of investigations conducted with small groups of subjects (four to six volunteers) under noise conditions provided by a jet engine with and without its afterburner in operation. Noise levels close to 140 db (re: 0.0002 dyne/sq. cm.) were recorded when the afterburner was operating (this level existed for intervals of only a few minutes duration), and 128 to 135 db (which was the more frequent noise level) was considered the "quiet" period. Subjects wore ear protectors which were reported to have acoustic insulation properties ranging from 26 db to 40 db for low and high frequencies, respectively.

The general results of the series of tests indicated that the high noise exposure had an adverse effect on the subjects' performances. In a two hand test where subjects were required to compress, with their hands, two dynamometers joined back to back, it was deducted

that the total output of the right and left hands was decreased two per cent and that the subjects as a group did not or could not conform to instructions, i.e., "squeeze both hands at once as hard as you can," under the high noise condition as well as in "quiet."

Reaction Time Study

In a test requiring the subject to assemble 27 varied colored blocks so that when assembled the blocks formed a cube with the same color paint facing on one of its sides, it was noted that the subjects experienced an increase in the amount of the time required to complete the assembly during the noise condition rather than an anticipated decrease expected as the result of practice. In a test of reaction time required to perform a function following the receipt of a visual signal it was concluded by the investigator that "the effect of intense noise on such simple behavior as reaction time will vary widely according to individual differences." For a two hand coordination test which was conducted in two parts, with a deviation of conditions for the second part, data was produced which indicated in general that coordinated acts were slower and/or more clumsy during noise and that there was a tendency to perform hastily in the presence of intense noise.

The investigations published in the British and Benox reports regrettably employed too small a sample to establish statistical significance. Also, there was no reported attempt to control such variables as environmental factors which may influence the performance of subjects.

Another recent study,[33] as yet unpublished, explored the possibility of a noise and neuro-muscular response relationship. Attempts were made to carefully control the experiment, which consisted of exposing 52 subjects to 28 recorded sounds. The noises varied between 70 and 100 db (re: 0.0002 dyne/sq. cm.) inclusive and occurred in the octave bands 75-150, 150-300, 300-600, 600-1200, 1200-2400, 2400-4300, 4300-9600 cycles per second. The sounds were mixed in order of presentation, were interspersed with intervals of quiet.

The subjects performed a task requiring hand-eye coordinated movements. It consisted of driving a stylus around an eccentric pattern, by turning two crank handles on a device similiar to the compound slide rest of an engine lathe. The subject's performance was measured for noise and quiet exposures, in terms of response time, errors committed, production and precision.

It was found that response times and numbers of errors increased during exposure to these intermittent noises and that the relationship was statistically significant. Production and precision tended to be reduced in the presence of the noise. Exposure to noise in the upper frequencies (particularly 2400-4300 cycles per second) and at levels of 90 and 100 db tended to produce the slower response times and greater number of errors.

A survey of 23 nationally prominent safety specialists was made to determine if certain factors intrinsic in the experiment might be related to accident causation. It was found that there were implications which indicated that noise might have an adverse effect upon safe work performance, particularly with respect to slowed response time and an increase in the number of mistakes committed.

Noise and Safe Performance

There is some evidence, in addition to the preceding study's results, to indicate that noise may have an influence on safe performance. For example, speed of response and accuracy of performance have been reported[34, 35] to be related to accident causation. An unfavorable relationship between noise and speed and accuracy of performance has been indicated by a number of research studies.[24, 26, 33] The earlier investigations did not attempt to identify the frequency or sound level of the noises used. One,[33] however, indicates that sounds above 90 db and in the 2400-4300 cycle band may have the more pronounced effect. This is somewhat supported by the findings of a study[36] on the annoyance values of interfering noises. It reported that the more annoying frequencies were those above 2000 cycles.

With respect to the effects of steady and intermittent noises, it may be summarized that experiments which were conducted with a reasonable degree of precision indicate that steady or expected noises do not adversely affect psycho-motor activity to any degree of significance. In a large number of environmental situations, however, noises are neither steady nor expected.

In many respects, it seems, the effects of noise depend largely on the individual differences of people—what is music for one man may be disturbing for another. But

Figure 2

Speech Interference Levels for Normal Speaking Voice

Distance from Listener (ft.)	0.5	1.0	2.0	3.0	4.0	5.0	6.0	12.0	24.0
Speech Interference Level (db)	71	65	59	55	53	51	49	43	37

there appears to be a place of commonality that exists for controlling the harmful and annoying effects of noise. When the speech interference levels, damage risk criteria and annoyance values are considered, it is seen that noise levels which approximate 90 db become critical. The maintenance of an environment to control sound pressures for one of these factors should bring improvements in the others as well.

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VEREIN DEUTSCHER SICHERHEITS-INGENIEURE

German Association of Safety Engineers, Young Professional Society, Works Successfully To Advance Accident Prevention Goals

by Eugene L. Newman

Official emblem of VDSI, above, is symbolic of members' watchfulness over industrial activity.

VEREIN Deutscher Sicherheits-Ingenieure (VDSI) stands for the German Association of Safety Engineers. The aim and purpose of the association is the futherance of occupational safety, particularly through the exchange of technical experiences. The association is non-profit and devotes all income from dues and contributions to the furtherance of the objectives.

The VDSI was organized on May 24, 1951, at Koenigswinter on the Rhine River. It was first called the Work Association of Safety Engineers. The organizers were 30 safety engineers from various West German industries. The work of the association was to be in close cooperation with official safety control boards such as the *Berufsgenossenschaft* (Occupational Union), *Zentralstelle fuer Arbeitsschutz* (Central Office for Work Protection), *Bund sinstitut fuer Arbeitsschutz* (Federal Institute for Labor Protection), *Werkaerztliche Arbeitsgemeinschaft* (Medical Labor Office), *Verein, Deutscher Revisionsingenieure* (Union of German Revision Engineers), *Verein Deutscher Ingenieure* (German Association of Professional Engineers) and other organizations, as well as research laboratories.

During the remainder of 1951 the association continued to develop. In 1952 the founding members held a meeting in Siegburg, Germany, adopted Statutes of Organization and made plans for the future growth of the association. At that time the membership was 200.

The association grew substantially in membership and influence throughout the Federal Republic during the years 1953-54. In order to strengthen the position of the association and give better service to the membership, the association was reorganized in 1954 and became the VDSI. At present the membership totals more than 550, of which number 25 are Americans.

In 1952, when the European Federation of Safety Engineers was established in Brussels, Belgium, the VDSI joined this organization and has contributed a great deal to the advancement of the European Federation.

VDSI now has 14 chapters. Additional chapters are planned as the association grows. The territorial areas of the chapters generally conform with the boundaries of the lands (states) in Germany such as Bavaria, Hesse, Hannover and Rhineland-Pfalz. Meetings are held bimonthly at various locations—usually at member plants —such as Opel Motor Works (General Motors in Germany), Phoenix Tire Corporation (Firestone), I. G. Farben Chemical, MAN Diesel, etc.

Each chapter is required to hold, in addition to its regular meetings, a public meeting at least once a year to which people interested in occupational safety are invited. These include acquaintances of members, scientists, public officials, etc. The purpose of the special meeting is to acquaint the general public with the aims of the organization, its current activities and plans—and to create an interest in safety for all people.

Also, an annual conference is held nationally, which each year has grown in size. The VDSI, in conjunction with the Federal Institute for Labor Protection, the Medical Labor Association, the Association of Professional German Engineers, the Central Office for Accident Prevention and other organizations, now participates in an annual meeting called the Congress for Work Protection and Medicine. In 1955 the congress was held in Munich with a registration of more than 2,000.

The annual dues for the organization are 24 marks, or the equivalent of approximately $6.00. There are no chapters dues. A portion of the annual dues is given to the local chapter for operating expenses. Other portions of the dues are utilized to publish monthly a section

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in the *Aufklearungsblaetter fuer Arbeitsschutz* (Bulletin for Work Protection). This section is very similar to the Journal of the American Society of Safety Engineers in method of publication and in purpose. Other services to members include a yearly roster of members and monthly newsletters from the various chapters.

The requirements for membership are as follows:

To be a Full Member, a person must be chief of his company's safety organization.

To be the equivalent of the Associate Member classification of the American Society of Safety Engineers, the VDSI member must work as a technician or specialist in safety.

In addition, there is provision for a supporting membership, very similar to our Society's standard for Affiliate Member. There is no Junior Member classification.

The VDSI is governed by an Executive Committee consisting of a chairman, three vice chairmen, a secretary-treasurer and the chairmen of the 14 chapters. VDSI has no managing director, such as our Society, and no paid staff. All officers serve voluntarily and without compensation. The 1955-56 chairman of VDSI is Hans Steeg of the Mannesmann Iron Plants Inc., Duisburg-Huckingen, Germany. Mr. Steeg also serves as a vice president of another professional organization of which the VDSI is a member, the *Federation Europeene des Associations d'Ingénieurs de Sécurité et des Chefs de Sécurité* (FEAICS or the European Association of Safety Engineers).

A close working relationship is maintained between VDSI and the *Verein Deutscher Ingenieure* (German Association of Professional Engineers). The VDI is very similar in nature to America's National Society of Professional Engineers. The VDSI also cooperates fully with the technical safety inspectors who are employed by Germany's federal government and who correspond, in their duties, to safety inspectors from our various state labor departments.

Community activities of the various VDSI chapters vary with the locale. In some areas chapters work closely with local traffic safety officials, although the association's membership does not include any traffic safety personnel. (There is a separate organization, the *Bundesverkehrswacht* or the German Traffic Safety Council, to cover traffic safety activities.) In addition, VDSI chapters work closely with the small plants in their areas which do not employ full time safety personnel, and offer these small industries the services of the chapter members as consultants.

Many members are working as delegates of VDSI on many federal boards or projects. One of the major projects is the development of protective equipment. Recently, through the efforts of VDSI, the German Federal Republic passed laws regulating machine guarding, providing for minimum guards, etc. VDSI can feel proud that it helped in formulating this law.

Basically, VDSI's program is divided into three phases —technical, social and organizational.

The technical phase includes assistance when planning machinery and equipment, checking of new equipment, safety inspection, personal protection, hygiene, etc.

The social phase concerns assistance in equipping the work area, instruction of newly hired employes, training of supervisors, information, education, medical care.

The organizational phase consists of reporting of accidents, instruction sheets, accident investigation, safety administration, staffing, etc.

The VDSI in banding together has provided a coordinated effort toward the common goal in safety—accident prevention. While VDSI is not as large as the American Society of Safety Engineers, and does not have our Society's many years of tradition and experience to draw upon, it is making a very valuable contribution in Germany toward this universal goal of the safety movement.

Safety in Germany has been a road of many forks. Small groups and even individuals have been pursuing their separate paths. VDSI is consolidating these efforts and getting everyone concerned to work as a team.

VDSI President Hans Steeg, who directs the safety program for the Mannesmann-Steelworks Corporation, has been in safety work since 1936. He was one of the founders and first chairman, in 1951, of the Labor Community of Safety Engineers (ASI).

National officers, chapter chairmen (pictured at right) form Board of Directors of German Association of Safety Engineers (VDSI).

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EASTERN NEW YORK
Albany, New York

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AMERICAN SOCIETY OF SAFETY ENGINEERS

Membership Information

THE American Society of Safety Engineers has established the following classifications of active membership:

MEMBER —To be eligible as a Member an applicant shall be at least thirty years of age and shall be engaged in safety engineering. In addition, he shall have either an engineering or science degree in an accredited college curriculum and the equivalent of eight full years' experience in safety engineering; or he shall have had the equivalent of ten full years' experience in safety engineering.

ASSOCIATE MEMBER —To be eligible as an Associate Member an applicant shall be at least twenty-five years of age and shall be engaged in safety engineering. In addition, he shall have either an engineering or science degree in an accredited college curriculum and the equivalent of three full years' experience in safety engineering; or he shall have the equivalent of five full years' experience in safety engineering; or he shall have either an engineering or science degree in an accredited college curriculum, ten years' experience in professional engineering work and one full year's experience in safety engineering; or he shall have twenty years' experience in engineering work, of which at least ten have been at the professional level, and one full year's experience in safety engineering.

JUNIOR MEMBER —To be eligible as a Junior Member an applicant shall be at least twenty years of age and shall be engaged in safety engineering work, which if pursued the required time will tend to qualify the applicant for the grade of Associate Member. In addition, he shall have either an engineering or science degree in an accredited college curriculum or he shall have had the equivalent of one full year's experience in safety engineering.

AFFILIATE MEMBER —The Society also provides a special classification, that of Affiliate Member, for those not professionally engaged in safety engineering. To be eligible as an Affiliate Member an applicant shall be at least twenty-five years of age and shall have contributed to the advancement of safety engineering through demonstrated achievement in some related field of interest in which he has been engaged for at least three years.

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The American Society of Safety Engineers
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Chicago 11, Illinois
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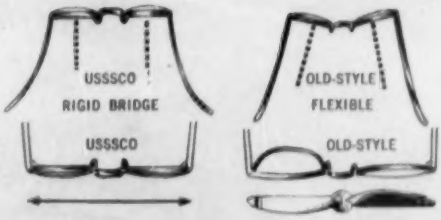

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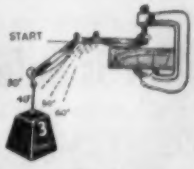

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COMING EVENTS

in the safety field

Feb. 7-8, Los Angeles
Seventh Annual Governor's Industrial Safety Conference (Biltmore Hotel). A. C. Blackman, chief, Division of Industrial Safety, State of California, 965 Mission St., San Francisco 3.

Feb. 26-28, Urbana, Ill.
Forty-third Annual Illinois Highway Engineering Conference (University of Illinois). John W. Hutchinson, assistant director, 303 Civil Engineering Hall, Urbana, Ill.

Feb. 28-Mar. 1, Urbana, Ill.
Ninth Annual Illinois Traffic Engineering Conference (University of Illinois). John E. Baerwald, director, 401 Civil Engineering Hall, Urbana, Ill.

Mar. 3-5, Richmond, Va.
Southern Safety Conference and Exposition (John Marshall Hotel). W. L. Groth, executive director, Southern Safety Conference, Inc., P. O. Box 8927, Richmond, Va.

Mar. 13-14, Philadelphia
Twenty-third Annual Regional Safety and Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, manager, Philadelphia Safety Council, c/o The Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia.

Mar. 18-22, New York
Twenty-seventh Annual Greater New York Safety Convention and Exposition (Hotel Statler). Paul F. Stricker, executive vice-president, Greater New York Safety Council, 60 E. 42nd St., New York 17.

Mar. 18-19, Boston
Thirty-sixth Annual Massachusetts Safety Conference (Hotel Statler). Bert R. Harmon, director of activities and information, Massachusetts Safety Council, 31 State St., Boston 9.

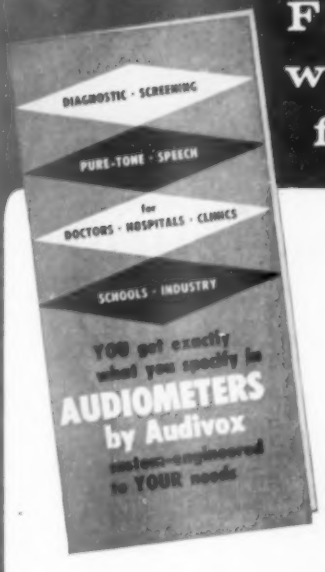
Mar. 18-20, Los Angeles
Fourth Annual Safety Congress and Exhibit (Ambassador Hotel). Joseph M. Kaplan, manager, Greater Los Angeles Chapter, National Safety Council, 3388 W. Eighth St., Los Angeles 5.

Mar. 19-20, Fort Wayne, Ind.
Northeastern Indiana Safety Conference and Exposition. Ivan A. Martin, manager, Safety Council, Chamber of Commerce, Fort Wayne, Ind.

Mar. 25-27, Houston, Tex.
Eighteenth Annual Texas Safety Conference and Governor's Highway Safety Conference (Rice Hotel). J. O. Musick, general manager, Texas Safety Association, 830 Littlefield Bldg., Austin, Tex.

Apr. 3-4, Indianapolis, Ind.
Tenth Central Indiana Safety Conference and Exhibit (Claypool Hotel). Jack E. Gunnell, director, Indianapolis Safety Council, Indianapolis Chamber of Commerce, 320 N. Meridian St., Indianapolis 11, Ind.

Apr. 3-5, Gainesville, Fla.
Fourth Annual Conference on Accident Prevention (University of Florida). Donald B. Wilcox, confer-



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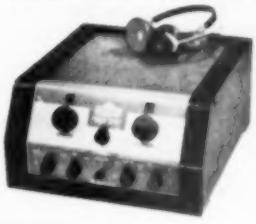

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ence coordinator, College of Engineering, University of Florida, Gainesville, Fla.

Apr. 8-9, Stockton, Calif.
First Annual Central California Safety Conference and Exhibits. Raymond A. Norwood, executive secretary, San Joaquin County Safety Council, Inc., City Hall, Stockton 2, Calif.

Apr. 8-9, Toronto, Ont.
Industrial Accident Prevention Association's Annual Convention (Royal Oak Hotel). R. G. D. Anderson, general manager, IAPA, 90 Harbour St., Toronto 1, Ont.

Apr. 9-11, Columbus, Ohio
The 27th All Ohio Safety Congress and Exhibit (Deshler Hilton Hotel). A. W. Moon, congress manager, Room 611, Ohio Departments Bldg., Columbus 15, Ohio.

Apr. 11-12, Kansas City, Mo.
Central States Safety Congress (Hotel President). George M. Burns, director, Kansas City Safety Council, 419 Dwight Bldg., Kansas City 5, Mo.

Apr. 25, La Crosse, Wis.
Southwest Wisconsin Regional Safety Conference. Oscar Wallschlaeger, Electric Auto-Lite Co., La Crosse, Wis.

"That's good advice on and off the highways!"

Apr. 29-May 1, Syracuse, N. Y.
Fifth Biennial Central New York Safety Conference and Exposition (Hotel Syracuse). Newell C. Townsend, administrative secretary, 351 S. Warren St., Syracuse 2, N. Y.

May 6-8, Allentown, Bethlehem, Easton, Pa.
Thirtieth Annual Eastern Pennsylvania Safety Conference. Harold A. Seward, secretary-treasurer, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

May 8-9, Niagara Falls, N. Y.
Seventeenth Western New York Safety Conference, in cooperation with the American Society of Safety Engineers (Niagara Hotel). Patsy E. Gismondi, executive secretary, 1436 Delaware Ave., Buffalo 9, N. Y.

May 9-10, Baltimore, Md.
Annual Governor's Safety-Health Conference and Exhibit (Lord Baltimore Hotel). Joseph A. Haller, executive chairman, Safety Conference, Department of Labor and Industry, State of Maryland, 12 E. Mulberry St., Baltimore 2, Md.

May 9-11, Winston-Salem, N. C.
Twenty-seventh Annual North Carolina State-wide Industrial Safety Conference (Robert E. Lee Hotel). H. S. Baucom, director of safety, North Carolina Industrial Commission, Raleigh, N. C.

May 15-16, Oklahoma City
Ninth Annual Oklahoma Safety

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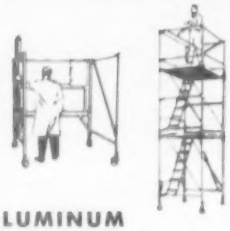

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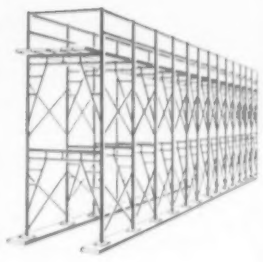

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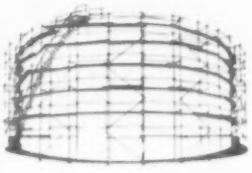

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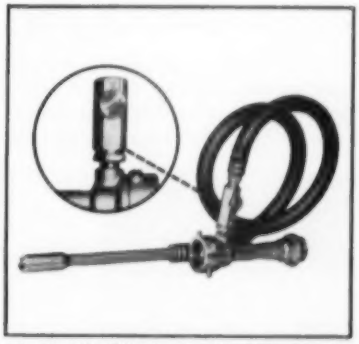

The Variable FW Metering Check Valve on the Rockwood Eductor is highly versatile (standard equipment). Both are incorporated in a single unit. Material is metered into the hose line in any proportion from 1% through 6%.

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Conference (Skirvin Hotel). Bob Eastman, manager, Oklahoma Safety Council, 1600 N. W. 23rd, Oklahoma City 6.

May 16, Lake Delton, Wis.
Rock River Valley Safety Conference. Allen Paschen, Northern Engineering Co., Baraboo, Wis.

May 23, West Allis, Wis.
Southeast Lakeshore Safety Conference. Dick Lutz, Falk Corp., 3027 W. Canal St., Milwaukee 8, Wis.

June 4-5, New Haven, Conn.
Twelfth Annual Connecticut Safety Society Conference (Jewish Center Bldg.). Dennis J. Hickey, manager, Waterbury Manufacturing Co., Waterbury, Conn.

June 6, Chippewa Falls, Wis.
Northwest Regional Safety Conference. C. R. Johnston, Cornell Paperboard Products Co., Cornell, Wis.

June 11, Stevens Point, Wis.
Wisconsin River Valley Safety Conference. Victor J. Bukolt, Lullabye Furniture Corp., Stevens Point, Wis.

June 13, Neenah-Menasha, Wis.
Fox River Valley and Lakeshore Safety Conference. Howard Aderhold, Marathon Corp., Menasha, Wis.

Sept. 17-19, Cleveland, Ohio
Nineteenth Annual Ohio State Safety Conference (Hotel Carter). H. G. J. Hayes, secretary-treasurer, Suite 514 - 2073 E. 9th St., Cleveland 15, Ohio.

Sept. 23-26, Montreal, Canada
Annual Meeting of the American Transit Association (Sheraton Mt. Royal Hotel). Arthur W. Baker, general secretary, 292 Madison Ave., New York 17.

Oct. 21-25, Chicago
Forty-fifth National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

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Diary

—From page 23

development to the plants, with special emphasis upon the access roads, crossings, parking facilities, and pedestrian walks.

Throughout my whole industrial safety career, I've fumed and fussed about the characteristic plant setup, which, since it just grew instead of being planned, always brought pedestrian and vehicular traffic flows into needless and hazardous conflict.

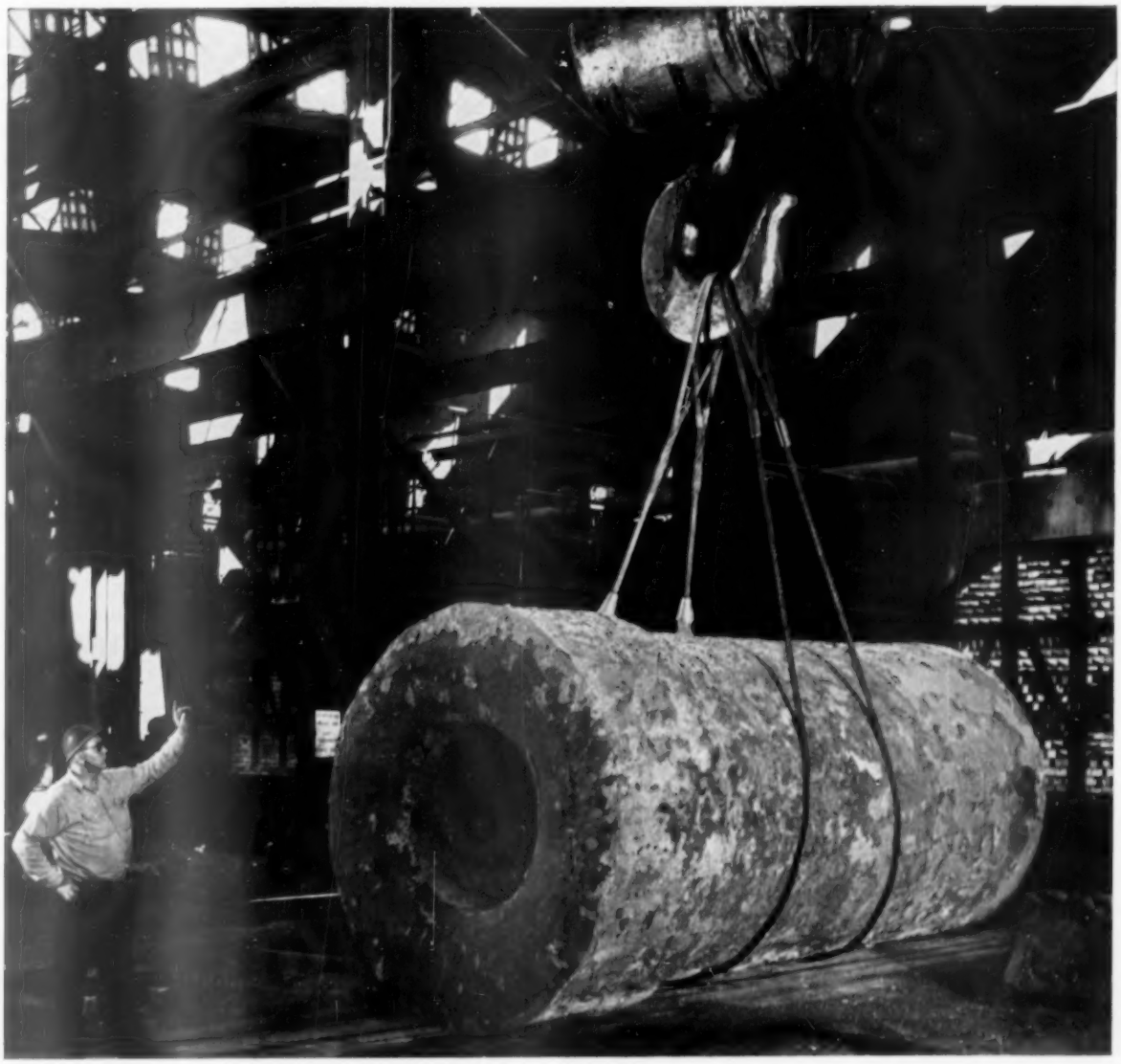
So, I thought, Project No. 1 was the careful planning needed to avoid or minimize such conflicts. Then, in a month or two, the emphasis will have to be on construction safety, as weather eases enough to permit full-scale activity.

Somewhere along the line, also, it will be necessary to go into the McCarthy plant and set up a model safety program to give a norm against which the other plants can be judged safetywise.

I spent the afternoon on Project No. 1—assimilating information and trying to guard against hasty, ill-formed judgments.

I drove back to the hotel in Greentown with the construction superintendent himself, and we had dinner together in the Mark Twain Arms—Greentown's down-at-the-heels best hotel.

Over coffee the super (Johnson



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Massive loads such as the one in the picture need prove no problem. In this instance, two different types of single-part slings were used in combination. It would be equally feasible to make the lift with braided slings, which are favorites of many shopmen. Perhaps you yourself would prefer still another type; whatever it might be, we could supply it quickly to your specifications.

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BETHLEHEM STEEL

is his name), came to the point:

"Mac's been telling me of your interest in the plans and studies that have been made. Would you mind telling me just what you're after?"

I told him what I had come to learn, and something of the whys and wherefores.

He considered for a moment, then said, "I would have thought a safety man would be concerned with operations. Since practically nothing is being done industrially, and very little constructionwise, there would seem to be little for you to do now."

I said, somewhat repetitiously, that I thought this was an excellent time to do the layout planning that would make the safety job later much more effective.

"The plans," he said, "are pretty well complete, as far as basic community and plant layout are concerned. It will be months before the details of machine location, lighting, and so on are worked out. It seems to me like a very poor time for you to intervene. You should have been consulted before, or else not brought in until later."

"Well, Hibbs, where've you been the past few days? You'd better come up with a good excuse!"

I told him I agreed it would have been desirable to bring me into the preliminary planning work. But that that was water over the dam. Under the circumstances, it was still better for me to be on the ground and make such suggestions as were desirable before construction proceeded too far.

He glowered. "That's about the way I figured you were thinking," he said. "Listen, fellow, have you got any idea what's involved in any major layout revision right now? Sure, you can draw new plans, nice little lines on sheets of paper. But do you know what a road is? Just some paving on the prairies? Nuts! It's a carefully chosen route for storm sewers and water lines, for electricity and a telephone line, for gas and sometimes a steam line. It's a scheduled amount of grading machinery utilization, concrete, landscaping.

"More than any of those, a road is a space between buildings, and those buildings are where they are because of a complicated set of factors, including some of the

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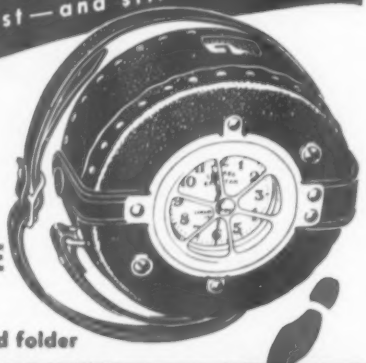

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damnedest and most varied subsoil conditions it's been my misfortune to study. And you want to come in and redraw what took months to work out!"

I told him that I understood some of the engineering problems, but also that I felt it was worth some expenditure of effort to prevent future accidents, and that certainly it was much easier and cheaper to make the changes at this stage than to revise existing structures. I considered emphasizing the point that I wasn't going fly-specking, changing things just for change's sake. But I decided not to, figuring it was better salesmanship to let my moderation come as a pleasant surprise.

So it was on a note of suspicion and disagreement that we parted after dinner, and I went upstairs to call a real estate man about housing for the family for the year in which I'll be commuting from Greentown.

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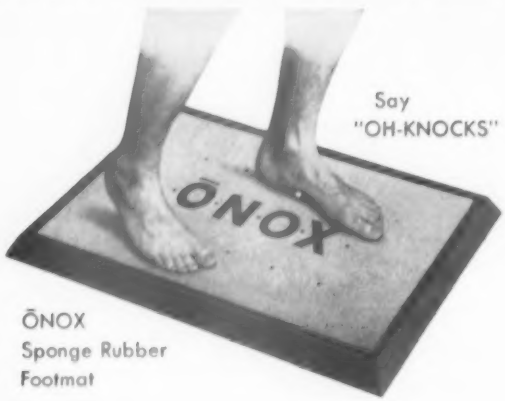
TO STOP ATHLETE'S FOOT



Say "OH-KNOCKS"

ŌNOX
Sponge Rubber
Footmat

74 of the 100 Largest Manufacturers use ŌNOX SKIN-TOUGHENER

Modern research has upset old theories about Athlete's Foot control. Skin specialists have proved that the best way to prevent Athlete's Foot is to improve the condition of the skin. *That's what ŌNOX does.* ŌNOX mineral salts toughen the skin and make it resistant to fungus growth.

No splash • No mess • No waste • Odorless
Easy to maintain • Nothing to get out of order
Men like ŌNOX • Relieves tired, aching feet

60 DAY TRIAL OFFER
We will ship your trial order for any amount of ŌNOX and footmats. *You pay nothing* unless fully satisfied after 60 days' use.

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BROOKLYN • CLEVELAND • NEW ORLEANS
HAWTHORNE, CALIF.

Young People Can Help "Back the Attack"

"WHO'S RESPONSIBLE for traffic safety in our town, Dad?"

Don't be surprised if your child comes home from school some night with that question. And don't be surprised if he greets your "everybody" or "the police," with this retort: "That's a good answer but there's more to safety than that."

Children may come up with such questions because in schools across the United States they're being taught traffic safety. They're learning the eight essential elements of a good traffic-safety program: police traffic supervision, traffic ordinances, traffic engineering, traffic courts, accident records, school traffic education, public safety education and safety organization.

They're learning, too, that those elements have a dual function: facilitation and safety of traffic.

The basis of this learning is a series of lessons—the first of which was published in the February 1957 issue of *Safety Education*—lessons set up as an experiment in education for democratic community living. It is hoped that the lessons will encourage students to study their community, and then, with the help of parents or teachers, determine how to make their community safer. The class will, in effect, be a fact-finding body which can make recommendations for improvements after gathering information.

Individuals can contribute to traffic safety in the community by studying traffic accidents. No person, then, is too young or too old to make a contribution.

Your child's school, though, may not be teaching this subject; and two reasons are: (1) The school may be conducting similar experiments in education for democratic community life in some other area: water purification, rodent control or public education, and (2) educators may not know this material is available. (A copy of *Safety Education* or a reprint of the first unit might be sent the local superintendent of schools, school principal or teacher.)

"One of the finest off-the-job

ZORBALL

keeps all slippery surfaces

ZORBALL *absorbs oils, greases, paints, chemicals.*

Sprinkle freely on icy, wet walks, drives, etc.

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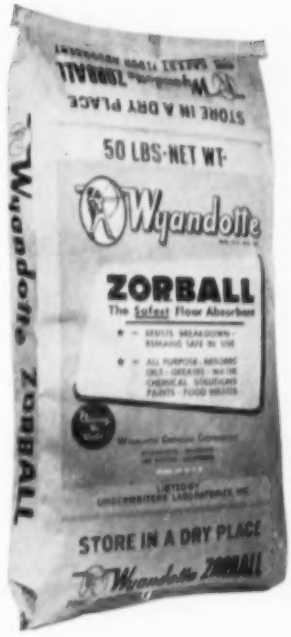
Avoid accidents, work slowdowns due to slipping on oily, greasy . . . or icy . . . plant steps, floors, ramps, walks, driveways, loading and shipping platforms with all-purpose Wyandotte ZORBALL!

ZORBALL is the safest, most effective floor absorbent you can buy — remains skidproof after absorbing *any* liquid, and it's fireproof, even when saturated with combustible liquids! ZORBALL is harmless to fabric, wool, metal, rubber, asphalt and wood surfaces, grass; harmless to skin.

ZORBALL has the lowest use-cost of any floor absorbent. It has exceptional resistance to breaking down, mudding, dusting, caking, and tracking. And, after drying out, it can be used again. Remember — it costs less to *prevent* accidents with WYANDOTTE ZORBALL!

For a free sample or complete data, mail coupon below, or call your Wyandotte representative now! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*



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CHEMICALS
J. B. FORD DIVISION

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Wyandotte Chemicals Corp.
Wyandotte, Michigan

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☐ Have representative call

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Firm _____
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City _____ Zone _____ State _____

safety activities an industry can undertake is the 'Back the Attack' program," said Russell I. Brown, director of safety education, Department of Public Safety for Iowa. "Management," he said, "can encourage community officials through cooperating in the Annual Inventory of Safety Activities. It can lend its interest, understanding and backing to the presentation of Inventory recommendations and exert influence toward adoption of the recommendations. Further, it can see that its employees understand their citizenship responsibilities in regard to traffic safety."

Certainly, any industry which agrees with him would find invaluable help in the school-taught safety lessons, written simply but suitable for adults. Unit 1 introduces the study of traffic safety. Succeeding units, to be published monthly, deal with specific sections of the Inventory and cover questions thought by experts in each field to be important to traffic safety. The March issue of the magazine, for example, is to contain a lesson on police traffic supervision.

Further information about "Back the Attack" lessons may be obtained from School and College Division, National Safety Council.

How do YOU clean an ENGINE BLOCK?
AUTOMATIC
POWER AGITATED
HOT TANK
Hot wash an entire engine block or 200 lbs. of Parts
FAST!
DOES IN MINUTES WHAT FORMERLY TOOK HOURS!
Kleerflo
POWERMASTER DEGREASER
Rapid vertical strokes of the motor-driven rack create a washing pressure in the heated cleaning compound, flushing off grease and grime without mess.
HI-T GREASE OFF
RECOMMENDED CLEANING COMPOUND!
The Kleer-Flo POWERMASTER is equipped with a powerful gas immersion type heating unit which works equally well with natural, manufactured or bottled gas.
CAN BE USED AS A COLD WASHER TOO!
CALL, WIRE, WRITE FOR INFORMATION
America's Foremost Producer of Parts Cleaning Equipment
PRACTICAL MFG. CO.
2840 4TH AVE. S. • MINNEAPOLIS, MINN.

Many Drugs Affect Driving Ability

MANY COMMONLY used drugs, including tranquilizers and antihistamines, may have a harmful effect on automobile drivers. The warning is contained in the proceedings of New York University's Symposium on the Medical Aspects of Motor Vehicle Accident Prevention, which appear in the December 15 issue of the *New York State Journal of Medicine.*

One hundred and twenty-five physicians and traffic authorities attended the Symposium on May 23, 1956, at the New York University-Bellevue Medical Center. The meeting was co-sponsored by the Medical Center and the NYU Center for Safety Education.

Recommendations of the conference's committee on drug and chemical aspects include:

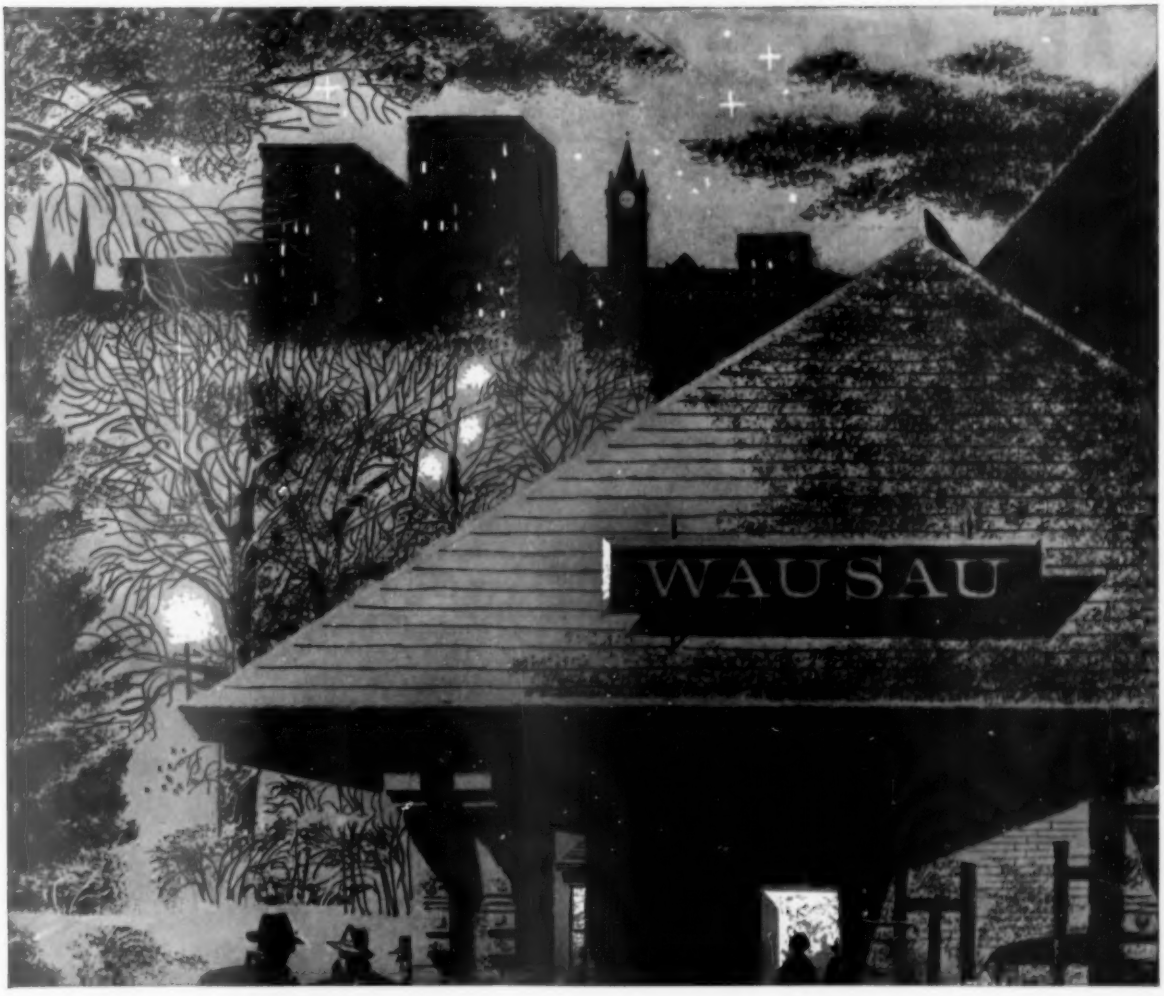
—That further research be conducted on the psychologic and physiologic effects of commonly used drugs and on their relationships to automobile driver behavior.

—That the medical profession be educated in adapting prescriptions of such drugs to the occupation of the patient and in giving patients proper warning of possible effects on driving.

—That the public be educated to the fact that many medicines have effects on automobile driving.

—That research be conducted on the possibility of legal control of use of drugs in relation to driving.

Symposium proceedings also include reports on psychiatric-psychologic and organic medical aspects of traffic accident prevention. Reprints can be purchased from the NYU Center for Safety Education, Washington Square, New York 3.



How come one of the world's most important insurance companies is located in Wausau, Wisconsin?

The fishing's good near Wausau. It's only a stone's throw to where the deer run. Once in a while, they say, a lynx comes down from the north.

And it's the home of one of the world's most important insurance companies.

How come?

This was lumber country once. And lumbering was a hazardous business. 46 years ago a group of lumbermen joined together to pay the claims of injured sawmill workers under Wisconsin's new workmen's compensation law. The group came to be called The Employers Mutuals of Wausau.

Wausau is no longer lumber country. But Employers Mutuals has stayed. So have the men who guided the company from the very beginning.

How come?

Because they knew that something good had grown up there. A certain way of doing business that was good. An almost *personal* character. A fairness that bent over backward rather than forward. Policyholders and their employees kept saying that Employers Mutuals were "good people to do business with."

There was a "Wausau personality" about us that people seemed to like and we didn't want to lose. We're a large company today. We write all types of casualty and fire insurance, and are one of the very largest in workmen's compensation. We have two reputations, born and raised in Wausau, that we aim to hold. One is unexcelled service on claims. The other is an accident prevention program that means lower costs to policyholders.

We're still "Wausau." But today there are offices of Employers Mutuals of Wausau in 101 cities. "A little bit of Wausau" is near you, wherever you live. And we're still good people to do business with.

Employers Mutuals *of* Wausau "Good people to do business with"

SAFETY OFF THE JOB

Suggestions for company and community programs

By GRANT O. SHIBLEY

NSC Staff Representative, OTJ Safety Committee

Ideas to Promote O-T-J Safety

—Display a wrecked car (adequately labeled) at the factory entrance. An automobile recovered from a recent highly publicized local accident has a good effect.

—Build a small mock cemetery with graves marked by large crosses in a vacant lot along a highly traveled road in view of the passing traffic.

—Arrange for a day of free automobile inspection in space set aside in the company parking lot.

—Provide racks at plant exits for pamphlets on various subjects pertaining to safety off the job.

—Sponsor clubs for wives of employees. Off-the-job safety would be one club project.

—Supervisors may send personal letters and pamphlets to homes regarding the importance of accident prevention throughout the 24 hours of a day.

—Set up a display room representing the kitchen of an unsafe home where employees can view the numerous items of unsafe equipment and hazards possible.

—At the annual company picnic or party have exhibits or displays to show the entire family the importance of safety, both off and on the job.

—Include a discussion of off-the-job safety in indoctrination courses.

—Furnish check lists for home inspection programs. Sponsor contest for members of the family with the check list to be returned with an essay on an appropriate subject.

—Hold local safety clinics for representatives of local industries. Off-the-job safety would be a part of the program.

—Use radio, TV and local newspapers to tell of your program.

—Discuss off-the-job as well as occupational accidents at the regular plant safety meetings.

—Use the plant publication to call attention to off-the-job hazards and to recommend safeguards.

—Organize a bureau to furnish speakers to take the mesasge to the PTA groups and schools.

—Use available films on the subject both in the plant and in the community.

—Ask supervisors to interest themselves in accidents involving employees while away from their regular work.

TEN MONTHS SUMMARY - 1956 - OFF-THE-JOB LOST TIME INJURY EXPERIENCE OF 75 COMPANIES REPORTING TO NSC

	Group I				Group II*			
NUMBER OF EMPLOYEES	October 122,922		Ten Months 1,043,111		October 121,613		Ten Months 1,159,513	
	No.	Days Lost	No.	Days Lost	No.	Days Lost	No.	Days Lost
TRANSPORTATION	89 (1)	2232	787(20)	19580	53(2)		619(28)	
Auto-Truck	85 (1)	2065	746(19)	17731	48(2)		584(27)	
Bicycle			2	50			3	
Bus,Streetcar			4	91	1		4	
Motorcycle	1	20	15	196	2		14	
Railroad			0	0			1	
Boats			3	23	1		5	
Pedestrian	1	31	10(1)	415			2(1)	
Other	2	116	7	1074	1		6	
HOME	123(1)	2194	1265(2)	19609	60		1022(3)	
Firearms	2(1)	40	14(1)	291				
Machinery,Tools	8	80	106	1666	12		112(1)	
Fire,Explosion	6	217	29	647	2		30	
Electricity			2(1)	6			2(1)	
Toxic,Material	3	6	30	91	1		15	
Fall,Slip	53	1673	542	10966	31		426	
Improper Lifting	10	110	106	1154	11		100(1)	
Not Object, Material	2	10	28	334	1		27	
Struck by Object	10	192	102	1158	9		115	
Sharp Object	17	103	139	1374	9		95	
Other	17	63	170	1922	4		100	
PUBLIC	39(1)	603	558(5)	8670	34(1)		572(7)	
Firearm		21	11	175	2		10(2)	
Sports	10	128	141(2)	1552	15(1)		257(5)	
Fire,Explosion	1	33	3(1)	45			4	
Fight,Assault	5	128	65	862	7		41	
Animals, Insects	1	1	8	57			15	
Exposure,Heat & Cold			24	88			55	
Fall,Slip	9(1)	215	235(2)	4971	6		102	
Struck by Object	3	36	32	550	2		26	
Other	3	41	29	170	2		42	
TOTALS OFF-JOB	244(3)	5129	2610(27)	47,859	167(3)	2607	2213(38)	37,103
TOTALS ON-JOB	57	1944	521(5)	21,223				

Note: Figures in parentheses are the number of fatalities included in adjacent figures.

*Group II is a separate group of reporters who do not include breakdown of days.

O-T-J Accident Summary, Metals Section

The following is the six-month summary of experience of 62 reporting companies with a total of 144,984,888 man-hours of *on-the-job* exposure.

Days lost off-the-job 67,189

Days lost on-the-job 98,453

Number of auto or traffic accidents 969

Number of other off-the-job accidents 1,142

Total number of accidents
on-the-job 855
off-the-job 2,111

Total number of fatal accidents
on-the-job 15
off-the-job 53

Ban Cuspidors from Chicago Post Office

THERE'LL BE no more cuspidors in Chicago's Main Post Office.

Tobacco-chewing postal employees will have to switch to gum, officials said, because their "art" creates "unhealthy and unsanitary" conditions.

Ridding post offices of cuspidors—which will eventually become as extinct as the scratchy-pointed pens that were retired recently—is also an economy move aimed at saving taxpayers about $25,000 a year.

Upkeep of the 2,000 cuspidors was expensive: Eight men were needed to keep them clean.

The Trust You Have Placed in Us

FREDERICK R. KAPPEL, President
American Telephone and Telegraph Company

"The telephone business is built on the idea of Service.... And the principles that guide our work affect the lives of many people. We are printing them here because they seem important to everyone who uses the telephone, everyone who works for the business, and everyone who has invested in it."

We in the telephone business are servants of the public. The services we perform are necessary to the people of the United States. They are necessary to the building of our nation and to our national security. Clearly, we occupy a position of great public trust.

We are also trustees for the savings of every individual who has put money in the business. It is our responsibility that the business shall prosper.

We think it all-important therefore that we furnish the best telephone service it is in our power to provide—a service high in value and steadily improving—at a cost to the user that will always be as low as possible and at the same time keep the business in good financial health.

The success of the business depends on the people in it. To serve well and prosper, Bell Telephone Companies must attract and keep capable employees. They must be well paid and have opportunity to advance in accordance with ability. And we must continually develop first-rate leaders for the future.

Finally, it seems to us that it is always our duty to act for the long run. Sound financing, good earnings, reasonable and regular dividends—these are all long-term projects. So is our continual research to find better means for giving better service. So is the building of the human organization and character on which good service depends. So is the training of leaders. In all our undertakings, the long view is essential.

This is the way we understand the trust you have placed in us. It is a trust that deserves, and will continue to receive, the most painstaking care we can give it.

Working together to bring people together
BELL TELEPHONE SYSTEM

Industrial Standards

—From page 25

standards by industry, and limited promotion of use of the standards.

The first comes from the nature of the initial program of industrial safety standardization, namely, the development of safety codes for use by regulatory bodies. So much emphasis was put on that phase of the program that industry failed to recognize that the safety codes constitute one of the best available sources of technical information on which to base industrial safety operations. Many plant safety departments don't have on file a set of the safety standards applicable to operation of their plants.

This nullifies one of the objectives of the National Safety Council. The increase in activities of the American Society of Safety Engineers in standards development and promotion on national and chapter levels is beginning to bear fruit.

Second area of shortcoming is promotional activities pertaining to use of standards by regulatory bodies. Cases could be cited of a state agency developing a draft regulation on a subject covered by an American Safety Standard. And because industry, labor and manufacturers that had participated in the development of the standard made no attempt to advocate its use, a regulation in conflict with the standard came into use.

Present acceptance by regulatory bodies of American Safety Standards and other standards of national significance is largely because of the acceptance of some dedicated officials, who, understanding the principles on which American Safety Standards are developed and approved, have accepted them as the best available.

We all realize we are moving into a highly technical era. Activity will be on a high technical plane. Not technical necessarily in the sense of science and engineering (although they too will move forward to greater heights than ever before) but such activities as management, education, human relations and accident prevention will be carried on only by those skilled in such activities.

Every tool available that bears in any way on the activity must be brought into play. Standardization is one of those tools, and in accident prevention in all its phases, but particularly in industrial safety standardization, it will be a means of keeping on top of the technology. Standardization will translate established scientific information into usable educational material, engineering data and administrative principle, without which the safety engineer will be lost.

Even under present conditions many safety engineers are unable to keep pace with technology of their activity because they have failed to see the safety application of such standards as those for screw threads, limits and fits, surface finishes, pipe flanges and fittings and hundreds of other

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1. Faster hoisting due to non-spinning loads.
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24 standard types available from ½ ton to 250 ton working load
NO FINER PRECISION SWIVEL IN THE WORLD
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p H 7 P R O T E C T I V E C R E A M

Breck pH7 Protective Cream covers the skin with an invisible, oil-resistant film which is neither slippery nor sticky. This neutral film prevents contact of irritants with the skin. Breck pH7 Protective Cream is effective against such irritants as lubricating oils, grease, aromatic and hydrocarbon solvents, cutting compounds, synthetic resins, rubber dust, fiber glass, paint, duplicating inks and iron dust. Breck pH7 Protective Cream is easily removed with Breck Hand Cleaner or with soap and water, making the use of harsh cleansers unnecessary.

A Breck Industrial Preparations Booklet will be forwarded to you upon request.

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Safety Engineers

and all other executives responsible for life and property—

Send for complete data on this

New EMERGENCY LIGHTING SYSTEM by Standard

The only system of its kind listed by UNDERWRITERS' LABORATORIES, Inc.

Exceeds Requirements of the NATIONAL ELECTRICAL CODE

AREA-CONTROL PANEL

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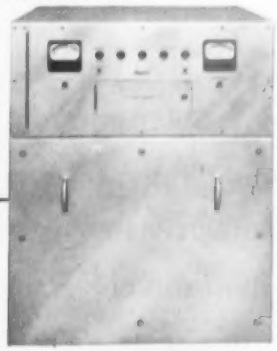


A complete, self-policing emergency lighting system that guards against costly confusion or panic caused by sudden darkness.

Takes over in a split second! The instant power fails for any reason, at any time, Standard's centralized system goes to work automatically — provides instantaneous Emergency Lighting in effected areas. Work schedules or business continues without interruption.

Always on Guard! 100% Electrically Supervised. Standard's Emergency Lighting System *protects itself* against human neglect or accidental disarrangement. Should anything in the system go wrong, doubly supervised circuits go into action instantly! A burned out lamp, accidental damage, or even a light fingered bulb snatcher — is reported to the Area Control Panel. Buzzers buzz! Lights light — and the trouble can be corrected before a lighting emergency arises.

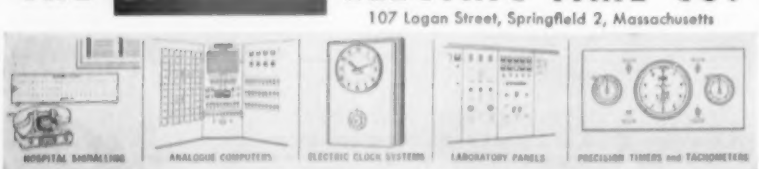
Always on Guard! The Flexlab Nickel-Cadmium, alkaline battery has an expected life of more than twenty-five years, requires near-zero maintenance, does not corrode like lead-acid batteries.

This new and unique Emergency Lighting System is streamlined, good looking, designed to match the decor of modern buildings. Centralized power and control, concealed wiring and handsome fixtures replace box-on-the-wall units. Standard's Emergency Lighting System is built-in just like the fire alarm and sprinkler systems.

Send for Publication # 243

THE STANDARD ELECTRIC TIME CO.

107 Logan Street, Springfield 2, Massachusetts



standards that affect design of products, construction of buildings, or equipment used in industrial operations.

Too often we as safety people have said that such matters are for design engineers, architects and construction engineers, purchasing agents and manufacturing and production engineers. We forget that such individuals are leaving our universities and colleges without any training in accident prevention.

We fail to realize that it is our job, as persons trained in techniques of accident prevention, to educate our industrial colleagues in safe practices and check what our colleagues do to insure maximum safety. No tool can be more effective in enabling the safety engineer to move forward in these directions. Standards are the consensus of what is right, of what is most effective.

To talk about nuclear energy reactors, piles, flux and the like seems to be the thing to do these days to show one's great knowledge. At the risk of thereby depreciating the importance of standardization in industrial safety by so doing, nuclear energy will be introduced into this discussion.

Some will have heard that an extensive program of standardization of nuclear energy is being initiated. When broken down so the underlying theme of this tremendous activity can be seen clearly, we find that the theme is essentially industrial and public safety. Scientific information assembled through defense research has to be translated into usable engineering data, not only so we may know how to apply the atomic theory to peacetime pursuits, but what is of greater importance, to do this with complete safety.

Standardization is the chief tool for this translation. In the highly technical era ahead, industrial safety and standardization must go hand-in-hand. One will never be completely sure of maximum safety unless personal opinion is set aside in favor of codified opinion as expressed through standards. No one will be able to possess the technical information necessary to a dependence on per-

sonal opinion. This makes codified opinion, expressed through standards, a source of information rich in the experience and knowledge of many.

The need for standards as expressed by those who brought the National Safety Council into being more than 40 years ago, stands out more than ever today in our accident-prevention efforts. The programs of the Council and the American Society of Safety Engineers in standardization stand out in importance and call for support from all who work in these organizations.

N.Y. to Hold Convention And Safety Week

EIGHT THOUSAND safety experts and accident prevention workers from all over the nation will convene in New York March 18 through 22 in an effort to reduce the country's annual accident toll.

The city will officially observe "Safety Week" during the convention period in welcome to the accident prevention workers and to emphasize individual responsibility for safety.

New York's 27th annual Safety Convention and Exposition will be held in the Hotel Statler under sponsorship of the Greater New York Safety Council. Supporting the accident reduction effort are seventy cooperating agencies, among them the Army, Navy, Atomic Energy Commission, Red Cross, branches of city and state governments, and business, civic and engineering organizations.

Sixty-two separate sessions have been scheduled, covering almost every phase of traffic, industrial, home, school and public safety. More than 200 addresses will be made and reports read by scientists, engineers, federal officials, law enforcement officers, educators, industrial and insurance executives, and safety directors.

The Safety Council will hold, in conjunction with the convention, an exposition of latest developments in safety devices, protective equipment, demonstrations of psycho-physical tests, and other aids to accident prevention. One hundred and fifty firms and associations will have displays.

NEW MONO Mask® RESPIRATOR

Lighter · One Piece · More Comfortable

Willson's new Mono Mask now brings maximum protection and comfort with a design featuring integrally molded resilient rubber. Its one-piece construction and compactness provide these additional advantages:

- Easier to clean and keep clean
- Tapered edges automatically shape to facial contours
- Added safety with better fit
- Lower breathing resistance with dual outlet valves
- Fewer replacement parts
- Approved by U. S. Bureau of Mines (BM 2170)

Your Willson Distributor will be glad to demonstrate the new Mono Mask . . . Or write direct for descriptive bulletin.

Over 300 Safety products carry this world-famous trademark

Leaders in Research of Safety Equipment Since 1870

WILLSON PRODUCTS DIVISION

RAY-O-VAC COMPANY

205 Washington St., Reading, Pa.

Snubber Reduces Hazards Of Transfer Operation

TWO SNUBBERS installed on split exhaust manifold of barge engine control exhaust temperature, preventing flash fires where volatile liquids are handled.

THE FIRE HAZARD in connection with cargo unloading operations on fuel barges and in many industrial fuel and volatile transfer operations has long been a serious and costly concern.

In the case of the fuel barge pumping operation, the close proximity of the pumping equipment to the junction of the barge and shore transfer lines seems to be a prime source of trouble. With the engine and cargo pump located on deck only a few feet from the junction with shore lines, the equipment is in constant danger of being sprayed with the products of transfer in case of uncoupling or bursting of the transfer hose. Volatile liquids have been sprayed on the hot engine exhaust system resulting in flash fires. Controlling the exhaust temperature provides a sound and safe answer to this problem.

A solution for this problem is offered by the Burgess-Manning Company of Libertyville, Ill., in the recently developed water separator snubber, which controls the exhaust temperature to safe (below flash point) limits. Added features of exhaust silencing and spark arresting are provided in the same unit.

The accompanying illustration shows two Burgess-Manning WSS-4 snubbers installed on the split exhaust manifold of an Ashland Oil and Refining Company barge's Buda engine, which drives the cargo pump.

A water pump driven by the engine fan belt pumps water from a storage tank on deck to the exhaust pipe directly ahead of each snubber. In the installation shown the water input to the exhaust pipe is started manually, although automatic control can be provided.

Water introduced into the exhaust pipe reduces the temperature sharply. The water is removed from the exhaust by centrifugal action within the snubber and returned to the reservoir on deck to be recirculated thru the system. The action of the snubber causes the water to leave at the bottom and the safely cooled exhaust gases discharge from the top. Tests run on this installation showed the water temperature in the reservoir to be between 160 F. and 180 F.—and the temperature of the exhaust in the tail pipe to be between 200 F. and 244 F.

Further field tests on the part of the marine superintendent in charge are said to have demonstrated that gasoline sprayed on the revised exhaust system will not ignite.

CLOSE-UP of barge engine showing snubbers on exhaust manifold.

Business Pilots Win Safety Awards

SAFETY AWARDS were given to 29 pilot members of National Business Aircraft Association who have flown more than 1 million accident- and injury-free miles. Also cited were 59 pilot members who have flown more than 500,000 accident-free miles, and 26 corporation members whose aircraft have completed a total of 47,036,788 miles without mishap. Presentations were made at the recent Ninth Annual Meeting of the Association in Miami.

Member companies whose aircraft have flown 1 million miles or more in business aircraft consecutively without accident or injury were:

Anchor Hocking Glass Corp.
Armco Steel Corp.
Burlington Industries
Champion Spark Plug Co.
Cluett, Peabody & Co.
Columbia-Geneva Steel
Delta Drilling Co.
Essex Wire Corp.
Esso Shipping Co.
S. J. Groves & Sons
Hercules Powder Co.
Holley Carburetor Co.
International Harvester Co.
International Paper Co.
Kroehler Manufacturing Co.
Minneapolis-Honeywell Regulator Co.
Minnesota Mining & Manufacturing Co.
Monsanto Chemical Co.
Owens Illinois Glass Co.
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Wire from Washington

—*From page 14*

anniversary of the operation of the federal atomic energy program, the AEC commented that "steady progress was made in improving health and safety standards," and expressed satisfaction in its own safety record.

The National Committee on Radiation Protection, sponsored by the Bureau of Standards, recommended that radiation exposure limits be set up for the American people, and also recommended substantial reduction of the exposure limits for workers in atomic and similar plants. These proposals were intended to assure that exposure did not exceed an "acceptable risk" from the genetic point of view.

Geared to the belief that the field of accident prevention represents the area in which the greatest amount of progress can be made in saving lives, the United States Public Health Service's Accident Prevention Program has been established to serve state and local health departments. This occupational health program is now in the tooling-up stage.

Aviation. The House Committee on Interstate and Foreign Commerce submitted a report on the use of airspace. The Committee called special attention to the testimony before it "that the nation has reached a stage where, in the interest of safety and the expeditious movement of aircraft, control of all air traffic at higher altitudes is required regardless of weather."

As to the present system which permits under some circumstances uncontrolled airspace, where pilots operate on what is called the "see and be seen" system, the Committee said: "The Grand Canyon accident points out very clearly that the 'see and be seen' concept will be out of date in the jet age. Some more effective method of traffic control or collision avoidance is necessary. This control must be capable of being effective under all conditions, including airspace that is presently not controlled."

The CAA announced that the

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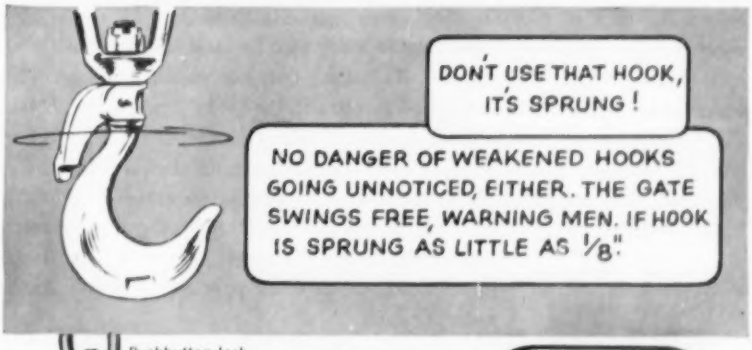
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safety record in civil aviation improved during 1956, as compared with 1955. The domestic schedule airline fatality rate per 100 million passenger-miles for 1956 was estimated at 0.62, compared with 0.76 for 1955. U. S. international flying saw no passenger fatalities during 1956. American irregular air carriers operating in domestic and international passenger service have had no passenger fatalities for more than one year.

Maritime Safety. The Chairman of the House Merchant Marine Committee recommended that foreign ships carrying American passengers should be required to comply with strict American safety standards. He filed a report of a group of technical advisors, which said that the *Andrea Doria*, which sank in a collision with the *Stockholm*, "would have survived" had she complied with U. S. standards instead of the less rigorous international standards.

The technical group's report recommended more effective standards for construction and operation of ocean liners; mandatory observance of sealanes for ocean traffic; tightening of the subdivision and stability requirements of the 1948 international convention for Safety of Life at Sea; an officer training program in electronic aids, and coordination between the government, the electronics industry and maritime interests in promoting maritime safety.

Home Safety. The Food and Drug Administration announced the conduct of a continuous survey of radioactivity of selected foods, to determine the naturally occurring "background radioactivity" in staple foods from different geographic areas, and then to monitor these foods for any changes in radioactivity which might be caused by weapons testing and other applications of atomic energy. This study is intended "to protect the public in the event this should ever be necessary," the FDA said, rather than any indication of present significant radioactivity in the food supply.

The FDA also announced the appointment of a new advisory committee on food standards.

Lenses from Plastics

—*From page 29*

plastics as a solution to this problem.

As a result, a method was developed for casting plastic optical elements with precision surfaces which require no grinding. A special formulation of polystyrene was used with an index of refraction similar to flint glass. Surfaces for use in mirror systems were aluminized by vacuum deposition, a standard practice in optical work. A low reflection coating was also applied by a spinning process.

Vinyls. In the vinyls, polyvinyl chloride is known to be a hard, hornlike material before compounding with plasticizers. Through their addition a wide range of flexibility and elasticity is obtained. Any color may be produced through dyes.

This plastic is strongly affected by exposure to light, especially when uncolored. The copolymerization of vinyl acetate and vinyl chloride results in a thermoplastic of marked versatility. It can also be copolymerized with thermosetting material. Most vinyls are inherently clear but have a very low softening point — less than 150 F. This curtails its usefulness for lens work.

Thermosetting Resins

In the thermosetting group of resins will be found a considerable number of compounds. Many of these are optically opaque or have a diffusing structure which make them unsuited for optical application. The few which are transparent possess characteristics adaptable to ophthalmic lens formation.

Polyester resins are prepared by combining unsaturated polybasic acids such as maleic, fumaric, itaconic, and phthalic acids with polyhydric alcohol. The product of this combination is a polyester of alkyd. This is dispersed in polymerizable monomers such as styrene, diallyl phthalate, or similar compounds. The mixtures of reactive alkyds and polymerizable monomer ready for polymerization usually are

Mr. Purdy *slipped*. . .

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supplied in liquid form. These range from free flowing to quite viscous liquids, depending upon their composition.

Copolymerization of these mixtures is accomplished by addition of catalysts, usually organic acids and heat. Castings can be made without pressure and low pressures usually are adequate for molding or laminating, although higher pressures sometimes are employed.

Unmodified polyester resins range in color from water-white to yellow. Transparent tints can be achieved by the addition of resin dyes. Polyesters are used primarily for casting transparent sheets for aircraft glazing where its resistance to crazing represents a distinct advantage over the thermoplastics. By proper formulation, resins capable of being formed to moderately simple or compound curvatures can be produced.

Within the past five years a new plastic lens was developed by Eastman Kodak, using a derivative of polyester. This new plastic lens resembles a flat sheet of plastic yet performs precisely as do regulation glass photographic lenses. Such a lens increases the over-all brightness of the image on the ground glass to a considerable degree.

As yet, these lenses are unsuitable for ophthalmic purposes since this material is subject to abrasion. The potential advantage in weight and increase in light transmission would constitute tremendous advancement if application as a cataract lens were possible.

Melamine-formaldehyde molding compounds are thermosetting. Mention is made of this plastic on account of its extreme hardness and rigidity. It is capable of withstanding continuous wear with negligible effect. The hard surface is unaffected by common organic solvents, greases, oils, weak acids and alkalies. When properly molded it is relatively insensitive to heat and is highly flame resistant. Although it possesses limited transparency, its predominant hardness characteristics should indicate future potentialities.

Phenolic molding materials are formed by phenol, formaldehyde, and furfural. The action of these chemicals may be modified and controlled in the formation of this resin. The desired properties in the finished molding material are achieved wholly by such control. The molding material can be shaped and hardened by heat and pressure.

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The particular merits of the products molded from this type of plastic in addition to hardness and rigidity is ability to withstand temperatures ranging from 250 to 475 F. They change only slightly with age or continued exposure to atmospheric conditions. They are not readily flammable and do not support combustion. Here, too, can be noted the versatility of the product, yet it was declared unsuited for lens work.

Urea-formaldehydes are made by combining the two resins with pure alpha cellulose fillers. They offer unlimited color possibilities, with a high degree of translucency, lightfastness, good mechanical properties, and complete resistance to organic solvents. Extreme hardness of surface allows them to be molded into objects intended for hard usage.

Allyl esters. As a result of the writer's investigation of a great number of plastics and research in the Dade County Medical Research Laboratories and the Opto-Medical Research Laboratories, coupled with experience in optical design and development, it was deemed that the allyl esters possess characteristics most adaptable to ophthalmic lens casting.

In the laboratory the transparent lens is produced from the clear, colorless water-insoluble monomer to which are added other chemicals and a catalyst. The complex process of lens formation, as it transgresses to block polymerization, bears castings which are extremely hard (Barcol scale 28-32 and harder, depending on the method and curing cycle employed).

The polymer is exceedingly strong. It is relatively insoluble, inert, colorless, and is free from internal strain or haze. It possesses the usual low coefficient of thermal conductivity. Its refractive index approximates that of glass. This newer organic ester is of low volatility and can be cast at low temperatures.

The developmental work that followed gave root to a method of compression-impression molding. This unique process is employed in the design and produc-

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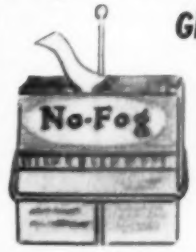

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tion of "Medilens," a new hard plastic lens. These precision castings advance the following properties:

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6. Impervious to ordinary household chemicals, including benzene, paint remover, acetone, and carbon tetrachloride.

7. Has greater abrasion and scratch resistance than any other known plastic.

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9. The lens will retain its clear water-white color indefinitely.

10. Molecular structure of the block polymer makes it extremely versatile in application to range of foci, types of lenses, single or multifocal, and tints.

Tinted lenses. Experimental efforts have added considerable advances in tints in plastic lenses. Any color of the spectrum can be applied to plastic lenses. Intensities yet unknown in glass lenses can be produced.

Uniformity of color is easily accomplished. If the tint of a complex lens is unsatisfactory, it can be changed by removal or alteration of the intensity of the tint. High vacuum evaporation has been effective in imparting a uniform coating to glass lenses. This, too, is being applied to plastics.

High plus lenticulars can be prepared directly in the molding process. High minus lenticulars can be similarly prepared or processed by fine sanding the edge on a flat surface. This edge will easily take a cloth or buff polish. Another method of applying a lustre to the edge is the use of clear lacquer or ordinary clear nail polish.

A lens can no longer be defined as "a transparent piece of glass, etc." (B. & L., "Helpful Hints to the Busy Optician"). The newer concept should describe a lens as "a transparent medium."

1,186 Die in Air Force Crashes in Two Years

ACCIDENTS in the last two years have killed 1,125 Air Force pilots and 61 civilians and destroyed 1,600 planes, according to an Associated Press dispatch quoting Brig. Gen. Joseph D. Caldara, director of flight safety research.

General Caldara urged public understanding of the necessity for continued jet flight training and said the Air Force is doing its utmost to reduce air accidents and fatalities.

The Air Force accident rate has been cut from 506 per 100,000 flying hours in 1921 to 15 per 100,000 flying hours today, he added.

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Traffic Safety

—*From page 19*

groups, when well organized, well financed and well managed, have proved extremely effective as a rallying point for public support and as a working partner of official agencies.

- They represent a method of tackling community problems with which businessmen are well acquainted and which they are well equipped to help solve.

To assure continuity of the work launched by the White House Conference, President Eisenhower appointed the President's Committee for Traffic Safety, charged with developing the objective of an active traffic safety organization in every state and community. A Business Advisory Panel of 25 national leaders in business was formed to encourage the participation of businessmen and their companies in state and local safety programs.

Immediately after the 1954 White House Conference, a group of business and industrial people in California went to work on an appraisal of the state's traffic situation. It was found that motor vehicle registration had risen above the 6½ million mark—about one vehicle for every two Californians.

Many streets and highways were seriously congested and in some cities peak-hour traffic jams had reached the point of strangulation.

One in every nine motor vehicles in the United States rolls along California roadways, although the total mileage of these roadways is but one-twenty-fifth of the national total.

The traffic death-rate in California in 1954 was higher than that of 14 other states—6.1 deaths per 100 million vehicle miles.

Two out of three fatalities in traffic accidents occurred in rural areas—indicating urgency in carrying traffic safety education into every California community and every high school, not just those in the metropolitan areas.

As a result of this study, it was agreed that a state-wide citizen organization should be formed to give strong support to all phases

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of organized traffic accident prevention. Thus was conceived the California Traffic Safety Foundation, incorporated in January 1956. It is a nonprofit, nonpolitical organization, privately financed and representative of all elements of California life.

The California Traffic Safety Foundation will have four divisions:

Traffic law enforcement;
Traffic engineering;
Public information; and
School traffic safety.

In addition to these, it will have a research and development service and a field service, giving it a broad organizational base.

What are the Foundation's objectives? They are as broad as the challenge it faces.

• To stimulate traffic safety education and to reach California's 6½ million licensed drivers through every medium of publicity and advertising.

• To work with state departments concerned with highway safety and the Governor's official traffic safety committee in developing recommendations for improved efficiency and for applying new techniques and research findings.

• To assist city or county authorities in upgrading their traffic control and safety operations by arranging for professional surveys of such local governmental functions as traffic courts, police agencies, traffic engineering and traffic ordinances.

• To work with trucking and commercial vehicle associations and motor fleet operators, with universities to promote research in the basic causes of accidents, with school authorities to expand classroom instruction in traffic safety and behind-the-wheel driver training.

• To assist community, county and area-wide safety councils with their local problems.

Now where do we go? How do we get down into the community?

First and most important, I urge any of you who has an interest in this problem and ideas as to what to do about it to work for the formation of a traffic safety council in your own community, if it does not have one.

The need for the creation of more of these organizations is great because your local police and court clerks and judges can't be expected to handle the whole responsibility for accident prevention and traffic education. They aren't equipped; they need the moral backing and physical help of the citizenry, and especially of the businessmen in the community.

Public understanding of the traffic accident problem and public determination to attack it requires effectively organized effort.

For one thing, the problem has to be studied and analyzed at the danger spots in your community where accidents tend to happen. You are likely to find, after a safety engineering survey, that some of these spots can be eliminated by applying such techniques as better lighting; by mak-

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ing road surfaces skid-resistant; by eliminating dips; by installing traffic islands; by routing traffic over one-way streets to eliminate special hazards, and so on.

You may find that your courts and police could improve their procedures for handling traffic violators. Does your police department have a special traffic unit? Are the police assigned to traffic specially trained for their duties? Do they keep up-to-date, cumulative records?

Sticking pins into a street map of the city at accident points is not enough. The record of an accident should, of course, tell where it happened, but to be of most use, *why* it happened—what the physical conditions were as to weather, visibility, road surface, and road hazards, speed of the vehicle, its defects, if any, condition and performance of the driver.

All these things are obvious, I know. But you would be surprised how few cities and towns keep full records of this kind. Yet we need to collect the facts on past accidents in order to take proper measures for the prevention of future ones.

Another aspect of the local problem is the practice of ticket-fixing. This indefensible practice sabotages the prevention of accidents by allowing a traffic law violator to go free of punishment for an act which, the next time, might involve him and others in death or injury.

Chief Justice Arthur T. Vanderbilt of the Supreme Court of New Jersey is authority for the statement that about 20 million of the nation's 72 million licensed drivers were ticketed last year for alleged violations. How many were "fixed?" No one knows, but Judge Vanderbilt notes that in a nation-wide survey of traffic courts made some years ago, unquestioned evidence of ticket-fixing was found in 39 out of 76 cities covered.

Where tickets are fixed, it is generally done without the knowledge of the police officer who served the summons. The practice makes a fool out of him and the law. It is directly responsible for lagging efforts in traffic law enforcement wherever it is allowed to flourish.

And yet it is simple to end ticket-fixing by introducing a uniform, non-fixable ticket, made out in quadruplicate with the original going to the traffic court and copies to police headquarters, the arresting officer, and the offender. New Jersey has eliminated the practice by this device.

Still another situation which offers citizens the opportunity to act effectively to encourage safe driving is that of driver training. How many of us were actually schooled in handling the high-powered mechanism we use daily and in which we are all too likely to die suddenly? Not many, I suspect, have been systematically trained to drive. Millions of American youths have picked up an ability to operate a car in much the same way that they have picked up most of the facts they know about life—through trial and error.

We are gradually moving toward the realization that the

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proper training of beginning drivers makes them much less accident-prone for life. One authority, noting that only about one in seven eligible students in the public schools of the United States is enrolled annually in driver training courses, makes the flat statement that "no application for examination for an original license should be accepted from any person who cannot show evidence of successful completion of an approved driver education course." I agree.

We tend to demand that cars be made safer without sufficient recognition of the fact that the most vital factors in an automobile's safety as an operating mechanism are still its brakes, lights and tires.

All these are, of course, supervised and inspected at your neighborhood service station or garage, if you give the station attendant a chance to perform this important service. Much can be done in any community to stimulate public attention to the need for regular safety inspection. That constitutes another task for the local safety councils.

From our own experience in the oil business, we know that safety is a never-ending quest and safety education a never-completed course of study. We must somehow get the same sense of responsibility for their own safety over to the driving public.

Engineers may install safeguards in and around a piece of machinery in a factory or plant and expect the operating rules to be observed. Not so with the automobile.

The engineers can accomplish much in designing them for safer operation. They may design highways in accordance with safety standards. But it takes something more to develop in you and me—and in our wives and teen-age children—an understanding of and respect for the physical factors that govern the safe operation of a 200-horsepower car.

Engineers cannot run the machine for us. Every American driver has somehow got to be educated up to an engineering sense of the right way—and the safe way—to operate a motor vehicle.

The gains in safety that American industry has made over the past 50 years are remarkable. I'm particularly proud of the safety record of the petroleum industry, which as a whole suffered, in 1954, only 7.9 disabling injuries for every million man-hours of work. That's about half the rate of 20 years ago.

Industrial history has shown that once the management takes a sincere interest in achieving better safety performance—and follows through on its program without compromise—the accident rate goes down. A company that wants safety for the sake of its employees, and for the sake of its operating costs, can go after and win an impressive safety record—one that pays dividends alike to employees and their families and to the stockholders.

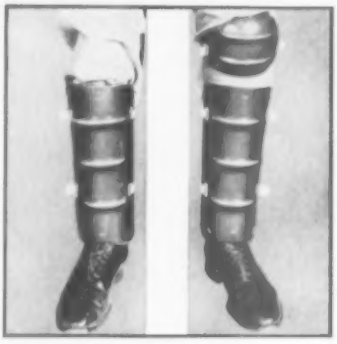
I think my point is proved by the over-all record of American industry. In 1933, nearly a quarter of a century ago, the death rate per 100,000 workers in the field of manufacturing was 25.

FOOT-TOE-LEG Protection by "Sankey"

"SANKEY" IMPROVED FOOT GUARD

The metal shield (above) is designed to furnish a maximum amount of protection to the entire front of the foot—not merely the toes alone, but also to the instep against hazards from falling, rolling or flying objects, or from accidental tool blows.

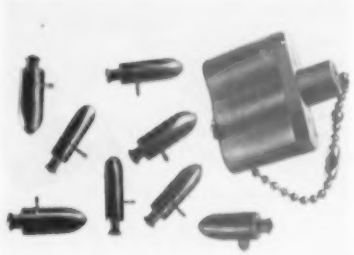
- Absolute freedom of leg motion, utmost protection and comfort come with the leg-contour shaped "Sankey" fibre shin guard (right).
- Fibre knee-shin guard (right) provides flexible knee movement on jobs with both knee and shin hazards.



For more information write today

ELLWOOD SAFETY APPLIANCE CO.

225 SIXTH ST.,—NSC ELLWOOD CITY, PA.



CUT DOWN NOISE

WITH THE SMR

EARSTOPPER

Soft, comfortable, resilient, the SMR EAR STOPPER adjusts itself to all shapes, turns and movements of the ear canal. Tends to anchor itself in the ear. Has a long life and is reasonable in cost. Furnished in a plastic case. Forty-five cents per set in gross lots.

Free sample when requested on company stationery.

SURGICAL MECHANICAL RESEARCH INC.

1905 Beverly Blvd., L. A. 57, Calif.

SMR

By 1954, the death rate has dropped to 12 per 100,000 workers. This is a reduction of 52 per cent.

The dismaying fact which we have had to face year after year is this: that the man who is meticulous about the rules and careful of every operation on the job tends to lose his sense of caution after work. Americans suffer far more accidental deaths and injuries off the job than on the job. In 1954, nearly seven out of 10 deaths and more than half the injuries suffered by employed people occurred after working hours; and most of the off-job deaths occurred in motor vehicle accidents.

American industrial management is becoming more and more aware that if as much progress could be made in achieving highway safety as has been made generally in industrial safety, the traffic figures would go down sharply. Corporation managements are having to look at safety as an around-the-clock, seven-days-a-week problem, for the very practical reason that a manpower loss occurring after working hours is just as disruptive to operations, and frequently just as expensive to the company, as one occurring on the job.

There you see opening up a new field of interest, study and activity for safety engineers and safety program supervisors—the safeguarding of workers after hours and off the job. It merges into the general problem of securing greater safety on streets and highways, since traffic is a major—and the most readily reducible cause—of disabling accidents.

I hope you agree with me, then, that there is a big job to be done in our local communities, at the corner of First and Main streets, so to speak. I would say it is the biggest part of the accident prevention job. We who are in the management end of business can make an indispensable contribution by getting to work in organizing our own communities to promote and advance traffic safety.

Business management involves the organization of people in working groups for the accomplishment of desired ends. The same principles that apply to the organization of our businesses can be applied to the organization of community leadership to meet the traffic safety problem. Commu-

Eyes DUSTY, DRY?

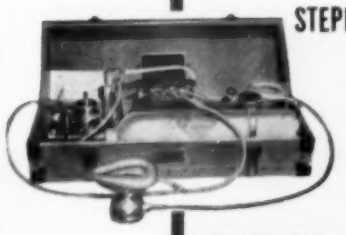
YOU NEED . . .
FOG-PROOF, GAS-TIGHT GOGGLES

. . . for paint spray, gases, dusts, fumes, smoke. They hug your face so securely that hazardous outside elements cannot reach your eyes. Fog is removed from lenses by an easy nod or shake of the head. The few drops of water placed on the inner wall of the lens do the trick. Can be worn with any respirator. Sample, $2.00 postpaid.

H. S. COVER, P. O. Box 2508 South Bend 14, Ind

"Respirators for Industry since 1894"

So Easy • So Simple • So Quick
TO SAVE LIVES
with
STEPHENSON "MINUTEMAN" RESUSCITATOR
when respiratory emergencies occur.
ASPIRATOR RESUSCITATOR INHALATOR
Most efficient in cases of heart attack, shock, suffocation, etc.
No industrial plant should be without this protection.
Write for FREE demonstration or pamphlet N-302.

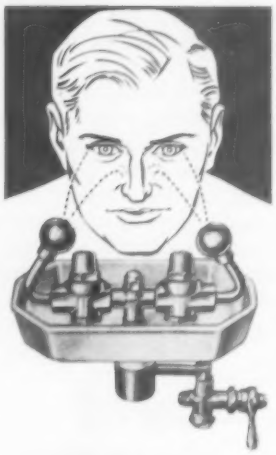


Light weight only 30 pounds.

STEPHENSON CORPORATION
RED BANK NEW JERSEY

the SAFE INVESTMENT

HAWS EYE-WASH FOUNTAINS



FIRST AID equipment for eyes is one of the best investments you can make! It minimizes costly insurance claims and thereby lowers your workman's compensation insurance rates—by reducing lost-time eye injuries.

Employees can cleanse injurious chemicals and particles from their eyes *instantaneously*—before the necessary medical aid can be reached. *HAWS Eye-Wash Fountains* and emergency drench showers are designed and manufactured in cooperation with leading Safety Engineers—they provide clear water at controlled pressure.

At a minimum investment, this valuable safety equipment practically pays for itself in reduced insurance rates. Write for full details TODAY!

HAWS DRINKING FAUCET CO.

1437 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA

Countless case histories record the fact that Sureseals outwear rubber and other synthetics (we make them, too) on most jobs.

SURETY SURESEAL INDUSTRIAL GLOVES

the only gloves made with HYCAR

For most of those "tough-on-gloves" jobs Surety Sureseals give you the greatest hand protection and longest service life. Sureseal has the highest resistance to practically all industrial chemicals, acids, oils, solvents, etc. . . . plus 4 times greater snag resistance and 10 times greater abrasion resistance. Write today on your letterhead and we'll arrange a test at our expense—just tell us the material gloves are subjected to. Sureseals are available in numerous styles including Turn-cuffs and various weights and lengths.

THE SURETY RUBBER CO.
CARROLLTON, OHIO
In Canada:
Safety Supply Co., Toronto

nity safety councils have proved extremely effective as a rallying point for public support of official agencies. They represent, as we have seen, a businessman's method of tackling community problems.

As members of the petroleum industry, our stake in improved traffic safety is altogether clear. We serve the motoring public. We power its cars and we supply the surface of the roads they roll on. Whatever serves to make motor transportation safer, more efficient, more pleasurable, more economical, obviously helps our industry—and you and me.

Blame Jets for Many Deafness Cases

AN INCREASING NUMBER of servicemen and veterans is affected by jet plane noise. And deafness from it is causing the government concern.

Veterans Administration officials, in discussing the problem, said the noise also may be affecting civilians.

An Associated Press dispatch from Washington, D. C., said recently that persons in the U. S. Air Force primarily affected by jet plane noise aren't pilots but ground-crew members—the planes travel so fast in flight they leave sound behind.

The VA is paying some $60 million a year in disability benefits to nearly 95,000 veterans for hearing loss and disease of hearing.

The air force, though unable to break down the number of cases caused by jet noise, estimated thousands were occurring.

Last June the VA revised upward its deafness disability-payment schedule because of the increasing number of vets totally deaf from the noise.

But the air force thinks research will lead to quieting of the jet plane noise. Another problem it's faced with, though, is the "thunderclap" occurring when a plane breaks the sound barrier.

The rich man never knows the kick the poor man gets from milking his own cow.

For a More Successful Poster Program

POSTER program aids miniatured on this and the following pages are NEW — shown here for the first time. Those illustrated in one color are actually printed in two or more colors.

Also, be sure to refer to the new 1957 Directory of Occupational Posters which contains an excellent selection of 756 posters on a great variety of subjects.

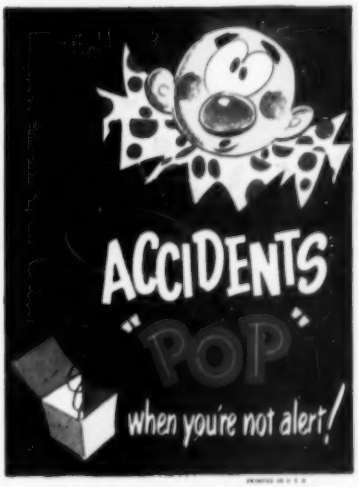
Copies of the new Directory are available at 60 cents each.

JUMBO POSTER for APRIL 1957

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".

SAFETY BANNER FOR APRIL, 1957

Here is the attention-getting, monthly cloth banner. Available in two types—indoor and outdoor—both are identical in size (10 feet long by 40 inches high), have the same general message and multi-color design. Indoor type is of sturdy drill with grommets for easy hanging, while the outdoor banner is of extra heavy drill, with wind vents, and has strong stitched-in rope for durability.



0742-A 8½x11½

This new four color poster is illustrative of the 72 four color posters shown in the 1957 Poster Directory.

Electrotypes of poster miniatures on this page are not available, but enlargements can be supplied.

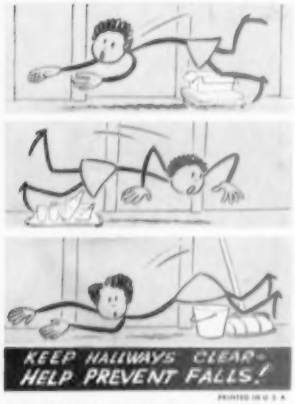
Posters below are printed in two or more colors

(Available only in sizes indicated)

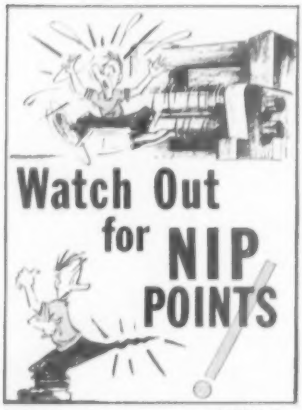
0939-B 17x23

0943-A 8½x11½

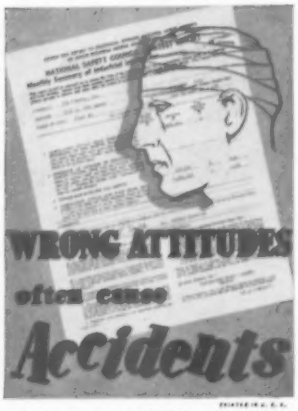
0740-A 8½x11½



0952-A 8½x11½

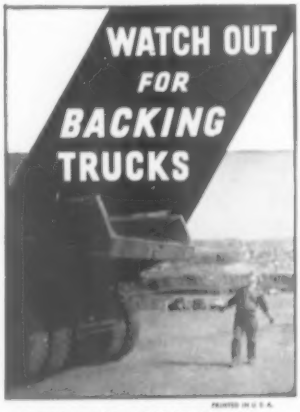


0670-A 8½x11½



0668-A 8½x11½

0831-B 17x23



0900-A 8½x11½

0833-A 8½x11½

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

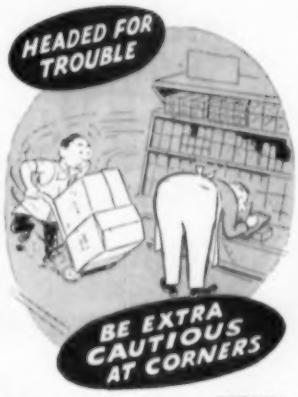
Posters below are printed in two or more colors

(Available only in sizes indicated)

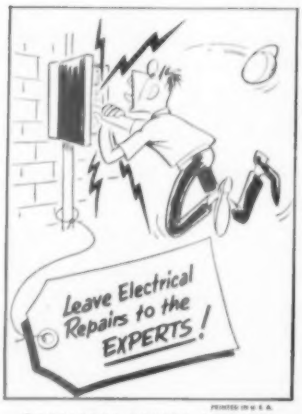
WACKY WILLIE
DOES A LITTLE WACKY STACKING!
I GOTTA STACK THIS STUFF IN A HURRY.
OH THOSE ARE COMIN' STACKY PILING UP ON ME!
Pile materials securely—cross-tie when necessary!

0995-B 17x23

0882-A 8½x11½



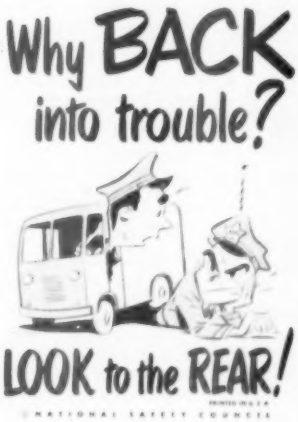
0956-A 8½x11½



0860-A 8½x11½

0950-B 17x23

T-0987-C 25x38
T-0988-A 8½x11½



V-0985-B 17x23

V-0984-B 17x23

V-0986-B 17x23

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

THERE ARE ALL KINDS OF SAND BLASTING CONDITIONS

Pulmosan

NO. 30 SAND BLAST HOOD

PROTECTS UNDER MODERATE BLASTING CONDITIONS AT MINIMUM COST

Lightweight, comfortable, fibre head-frame, adjustable and replaceable hammock assembly. Available with wire screen window or laminated glass with wire screen shield.

PULMOSAN STOPS Accidents

Pulmosan

SAFETY EQUIPMENT CORPORATION
644 Pacific Street, Brooklyn 17, N. Y., STerling 9-0200
1007 Washington Ave., St. Louis, Mo., CHestnut 1-9393

Write for further data and prices . . . request catalog describing complete line of Sandblast Hoods (air supply included) for every blasting condition

for

DISTINGUISHED SERVICE

Winners of National Safety Council Awards for outstanding records

THREE TYPES of awards are given by the National Safety Council to industrial units in recognition of outstanding performance in accident prevention:

1. **THE AWARD OF HONOR** is available to units whose records, though not perfect, meet rigorous standards of excellence. These standards take into account the previous experience of the unit as well as the experience of the industry in which it operates. A unit must qualify on both frequency rate and severity rate. The Award of Honor is available also to units which complete 3,000,000 man-hours without a disabling injury.

2. **THE AWARD OF MERIT** has similar, but less exacting requirements. Minimum number of injury-free man-hours needed to qualify is 1,000,000.

3. **THE CERTIFICATE OF COMMENDATION** is available only for injury-free records covering a period of one or more full calendar years and totaling 200,000 to 1,000,000 man-hours.

Details of eligibility requirements may be obtained by writing to the Statistics Division, National Safety Council.

AWARDS OF HONOR

Caltex, Entire company, New York City.

Convair, San Diego (Calif.) Div.

Goodrich, B.F., Footwear & Flooring Co., Entire company, Watertown, Mass.

National Advisory Committee for Aeronautics, Cleveland, Ohio.

Radio Corp. of America, Lancaster (Pa.) Plant.

AWARDS OF MERIT

Alco Valve Co., Entire company, St. Louis, Mo.

American Can Co., Fairport (N. Y.) Plant.

Chrysler Corp., Two awards: Missile Operations, Detroit; Engineering Div., Highland Park, Mich.

Continental Can Co., Inc., Passaic (N. J.) Plant 30.

Dow Chemical Co., Madison (Ill.) Div.

Fairless Works, National Tube Div., Fairless Hills, Pa.

Ford Motor Co., Two awards: Open Hearth and Electric Furnace, Dearborn, Mich.; Mahwah Assembly Plant, Dearborn.

General Electric Co., Two awards: Cleveland (Ohio) Lamp Plant, Ohio Lamp Plant, Warren, Ohio.

Panama Canal Co., Entire company, Balboa Heights, Canal Zone.

Seagram, Joseph E., & Sons, Inc., Lawrenceburg, Ind.

Sylvania Electric Products, Inc., Two awards: Danvers and Salem, Mass., Units.

Tennessee Eastman Co., Two awards: Acetate Yarn Div., Kingsport, Tenn.; Cellulose Esters Div., Kingsport.

Western Electric Co., Inc., Three awards: Detroit Area of Telephone Sales Div.—Inst.; St. Louis Area of Telephone Sales Div.—Inst.; Omaha Area of Telephone Sales Div.

The man who brags about running things at home usually refers to the lawn-mower and furnace.

WHAT'S NEW
IN NATIONAL SAFETY COUNCIL SERVICES

Chain Saw Safety

This lively eight-page booklet shows lumber workers the correct way to handle chain saws. In addition it provides many other hints on how not to get hurt in one of the most hazardous of occupations.

Well illustrated with cartoon-type drawings, the two-color booklet covers the hazards of felling, bucking, care of chain saws, fire prevention and first aid.

Although the booklet is intended for lumber workers, there is much in it that is applicable to other fields where chain saws are used.

Small plane becomes emergency ambulance with new stretcher

Here's another use for the versatile new Haggard's all-purpose stretcher kit. No matter what type of stretcher you now have, you have need for the new Haggard. It does all the things any stretcher can do, plus many more. It is a complete unit ready for instant use anywhere. It is so compact that it fits into a car trunk. Lightweight, only 28½ pounds complete with case, blanket, first aid supplies, and accessories. It's such a totally new concept in utility, versatility and practicality that you should investigate it at once. See how easy it is to store, transport, and put to use. See all the advanced, needed features that make it a combination litter, fracture board, traction splint, and resuscitator. Compact, convenient, complete. Ask your MSco distributor for a demonstration or write Medical Supply Company, Rockford, Illinois. In Canada, Safety Supply Company, Toronto 2.

Operation Safety

A powerful voice has been added to the forces working in the "Back the Attack on Traffic Accidents" campaign this spring. Not a new voice by any means, but for the first time on such an extensive scale, church people of all faiths will be making a broad appeal for more ethical behavior on the streets and highways. Speaking as one in a mass "crusade for safety," religious, educational and civic leaders are beginning to appeal to motorists to "Live by the Golden Rule in Traffic."

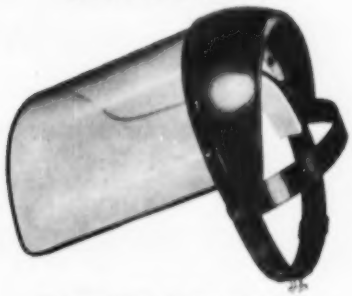
The Spring Operation Safety kit contains materials to help carry out a "moral responsibility campaign." Throughout its three monthly themes—Defensive Driv-

✳ Look to this page each month for latest news about NSC services. Address request for additional information, samples or prices to the Membership Department.

HERE! NOW!
TOMORROW'S
ANSWER TO
TODAY'S
SAFETY
REQUIREMENTS

Pulmosan

"NEW CONCEPT"
FACE SHIELD
SERIES PS 100



FEATURING 8 PRACTICAL POINTS OF SUPERIORITY

Headframe of unbreakable, soft plastic.
Reinforced all-plastic spark deflector.
Smooth, positive slide adjustment—6-8½ headsize.
Foam Rubber snap in-out sweatband.
Extra-wide acetate visor with new snap fastener.
Plastic bound visors.
More room between face and visor.
Featherweight—rugged—durable.

PULMOSAN STOPS Accidents

Pulmosan
SAFETY EQUIPMENT CORPORATION
644 Pacific Street, Brooklyn 17, N. Y., STerling 9-0200
1007 Washington Ave., St. Louis, Mo., CHestnut 1-9393

Write for complete descriptive literature, replacement parts list and prices on Series PS 100 (illustrated) and Series 200, 500 and 600 Face Shields.

THE SAFE WAY . . .

For car stops, on loading platforms, temporary sidings, cars on grades and traveling cranes. Used and recommended by leading Steel Companies, Manufacturing Plants, Mines, Grain Elevators, Cement Plants and Quarries.

WRITE FOR BULLETIN NO. 4

IPCO Safety Equipment for all Industries

INDUSTRIAL PRODUCTS COMPANY

2850 N. Fourth Street • Philadelphia 33, Pa.

BRAND NEW!

INTRODUCING . . . A NEW JUMBO SIZE SIPCO DUNKING STATION

Specially designed for use in plants where SIPCO DUNKING STATIONS receive more than average use. Goes shift after shift without attention, greatly reducing cleanup time. Heavy duty cast aluminum canister with reenforced "fill level" bottom. Interchangeable with standard size canisters on any model SIPCO DUNKING STATION.

PRESENT SIPCO USERS! Order NEW JUMBO size canisters separately. They are Interchangeable with your present standard size units.

UNIT No. 1J—Heavy duty cast aluminum JUMBO canister, attractive eye-catching metal sign, upright and heavy weighted base. 42" high, wt. 26 lbs.

UNIT No. 2J—Same as above except without upright and base. For mounting on walls, posts, columns or machines. Wt. 6 lbs.

UNIT No. 3J—(not illustrated)—Canister alone with mounting bracket.

WRITE FOR ILLUSTRATED FOLDERS

STANDARD INDUSTRIAL PRODUCTS CO.

DEPT. S • 920 N. GARFIELD AVE. • PEORIA, ILLINOIS

ing, Know and Obey Traffic Laws, and Vehicle Safety-Check — program and publicity materials emphasize the individual's moral responsibility for traffic safety.

Each month's packet contains special items — news releases, radio scripts, speech outlines — devoted to the theme of moral responsibility. The quarterly planning guide deals entirely with moral responsibility as a community campaign.

Here are contained many valuable suggestions on carrying out a program by working with religious, educational, and civic organizations. In addition, a special leaflet in the "Back the Attack" series on this theme is sampled in the kit.

The March theme is Defensive Driving—a technique long used by professional drivers to avoid traffic accidents by anticipating hazardous situations created by the unsafe acts of others.

In addition to the regular publicity and program materials, a poster and leaflet, both of which place emphasis on "the other guy," are also available. The featured poster of the month tells motorists "Don't Rely on the Other Guy." The leaflet warns "Keep Your Eye on the Other Guy."

For information on the Operation Safety program write to National Safety Council, 425 N. Michigan Ave., Chicago 11.

Manual Handling

—*From page 27*

cording to accepted company rules and practices.

—See that employees follow rules and standards faithfully.

—Instruct and correct employees intelligently so they will understand fully how to do their jobs and realize the advantages of following directions.

—Develop and keep employee loyalty and respect. Each man should be made to feel the importance of his job.

4. Equipment and layout. Even with skilled, careful workers and competent supervision, human failure or job variations may occur. Handling materials offers

plenty of chances for these. Frequently the use of special tools and protective clothing will minimize such risks.

Handling material is made easier and safer by the use of a wide variety of hand or hand-operated tools, jigs and other devices.

Hooks are used for handling logs, lumber, crates, boxes and barrels where the object will not be damaged. Hooks should be kept sharp and used so they will not glance off hard objects.

As old as the wheel is the use of a bar to obtain leverage in moving objects. The point or edge of a crowbar should be kept sharp. It should be handled carefully to minimize the chance of pinching or falling if the bar should slip or the object move suddenly.

In between unaided human muscles are tote boxes, dollies, wheelbarrows and hand trucks. They are relatively low in cost, economical to maintain, and help in handling jobs where more complicated equipment is not needed.

Many of these primitive devices have received new refinements. Light-weight metals and ball bearings make these devices easier to move. Maybe you can find improved models in the catalogs.

Even simple equipment needs careful maintenance. Handles get broken and need replacement, and regular lubrication cuts down the effort needed to push or pull vehicles.

Protective clothing is desirable on many handling jobs. Stout work gloves and safety shoes are basic protection while more specialized garments are needed for handling hot or sharp objects.

Automation to Keynote Materials Handling Show

THIRTY-TWO SPEAKERS, from all types of industries, will lead discussions at the 7th National Materials Handling Conference, it was announced by the American Material Handling Society, sponsor of the meeting. The conference will be held in conjunction with the National Materials Handling Exposition at Convention Hall, Philadelphia, April 29-May 3.

More than 100 types of materials-handling equipment will

Pump- don't slop INDUSTRIAL LIQUIDS

Get rid of antiquated methods such as pouring, drawing, siphoning, spigoting. Install Tokheims! These high-vacuum pumps are invaluable in maintenance and production work; they help build a barrier against fires and accidents, halt waste, speed production, and improve housekeeping.

Tokheims deliver up to 20 gallons per 100 strokes. No piston to leak, stick, or freeze. Available with hose or spout outlets.

Call your dealer, or Tokheim representative; write for literature — and approved liquid list.

FM

General Products Division
TOKHEIM CORPORATION
DESIGNERS AND BUILDERS OF SUPERIOR EQUIPMENT
1600 Wabash Avenue SINCE 1901 Fort Wayne 1, Indiana
Subsidiaries: Tokheim N.V., Leiden, Holland — GasFire, Inc., Shelbyville, Ind.
Factory Branch: 475 Ninth Street, San Francisco 3, California
In Canada: Tokheim Reeder of Canada, 205 Yonge St., Toronto, Ont.

QUALITY TOKHEIM HIGH VACUUM HAND PUMPS

HUNDREDS OF PLANTS SOLVE PROBLEM OF SKIN INJURY

"Kerodex" Offers Truly Effective Protection Against Skin Irritants

Irritation from epoxy resins and amine hardeners, "dope," solvents, cutting oils, and many other highly damaging substances is no longer a problem when "Kerodex" prevents contact with the skin. Hundreds of plants find "Kerodex" successful where other barrier creams fail.

"Kerodex"® spreads on easily and acts like a glove that is invisible yet strong and flexible. Does not smear. Does not affect materials handled nor is it affected by them. Available in two types. For full information write to Ayerst Laboratories, 22 East 40th Street, New York 16, N. Y. 5670A

SAFEGUARDS

pay off . . .

on increased safety and better production in the press room

- **Better protection that's easy on the operator** . . . the ram operated pullout guards the operator from **all** press repeats and from his own carelessness . . . but pulls **only** until he is safe. He can work faster, and in greater comfort!
- **Actually can improve production** . . . from use of foot trips and faster feeding.
- **Versatile and compact** . . . adapted to large or small presses. Strokes from 1 to 12 inches. Completely press-attached, requiring **no** floor space. Press may be inclined with no adjustment of guard. Pull out arms fold down flat when not in use. Simple, rugged, easily inspected.
- **SAFEGUARD users report full satisfaction** . . . from the many modern plants using SAFEGUARDS comes word of excellent acceptance by press operators . . . of increased operational speed . . . of praise from State Inspectors and Insurance Companies . . .

Your operators will be safer, do better with a SAFEGUARD.

Safeguard Manufacturing Company
Transylvania Road, Woodbury, Conn.

be demonstrated under simulated plant conditions. The conference will emphasize systems of handling, rather than any particular type of equipment. Both the show and conference have as their theme, "Materials Handling, Key to Automation." About 250 companies will exhibit.

The conference will open with a discussion of the trend of automatic handling and will close with a consideration of the needs for greater emphasis on handling in the years ahead.

Among topics to be discussed are new perspectives in manufacturing under automatic handling; the new look in shipping; eliminating warehouses; organizing a handling program; the effect of handling systems on plant design and layout; selecting and buying handling equipment, as well as getting maximum usage from it, and enlisting cooperation from plant personnel in the handling program.

APHA Elects Officers

THE AMERICAN Public Health Association announces the following officers for 1956-57, who were elected at the 84th Annual Meeting in Atlantic City, November 12-16:

President: John W. Knutson, D.D.S., assistant surgeon general and chief dental officer, Public Health Service, Washington, D. C.

President-Elect: Roy J. Morton, C.E., supervisor, Waste Disposal Unit, Health Physics Division, Oak Ridge National Laboratory.

Chairman of Executive Board: Lawrence J. Peterson, M.S.P.H., director of health, Idaho Department of Health, Boise.

Treasurer: Charles Glen King, Ph.D., scientific director, Nutrition Foundation, Inc., New York.

Reginald M. Atwater, M.D., is executive secretary of this professional public health group.

The Association has accepted the invitation of Cleveland to meet there in 1957 and has set November 11-15 as the dates. Dr. J. G. Smith, health officer of Cleveland, is chairman of the local committee in charge of arrangements. Headquarters will be in the Cleveland Public Auditorium.

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USE IT ON YOUR FLOORS FOR
**SAVINGS IN ABSORBENT!*
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QUALITY CONTROL
on master, joiner and end links
makes
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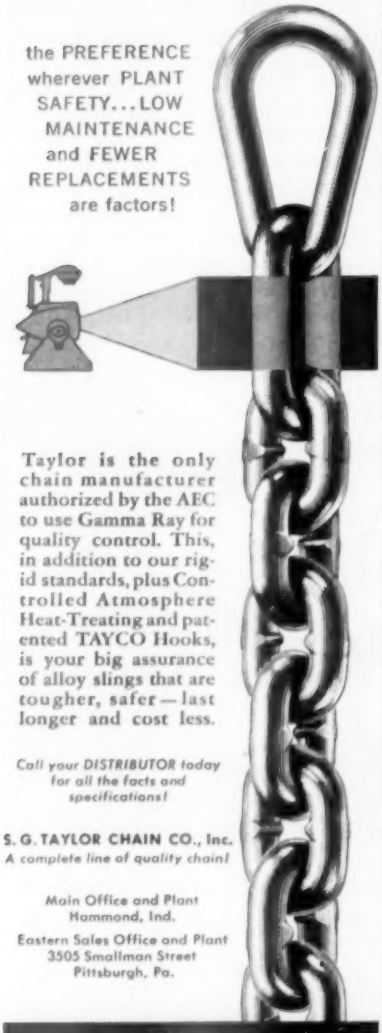
the PREFERENCE wherever PLANT SAFETY...LOW MAINTENANCE and FEWER REPLACEMENTS are factors!



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Call your DISTRIBUTOR today for all the facts and specifications!

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A complete line of quality chain!

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TAYLOR MADE
A GREAT NAME IN
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PERSONALS

News of people in safety and related activities

W. F. Brown to Aid Europe's Safety Programs

WILLIAM F. BROWN, safety director for Consolidated Edison Company of New York, will serve as consultant and advisor at the first European Productivity Agency's Industrial Safety Conference in Paris.

Following the week-long conference held in the latter part of January, he began a tour of many of the nations which are members of the group, such as Germany, Belgium, France and Italy, to help them set up national safety groups and councils as well as make suggestions on industrial safety practices.

Mr. Brown was granted a four-month leave of absence after the U. S. International Cooperation Administration asked him to act as consultant and advisor to the conference. The EPA is part of the Organization for European Economic Cooperation which is composed of 18 free European nations. His tour began January 1 and ends April 30.

During the conference which Mr. Brown coordinated and helped plan, he explained the advantages of such industrial safety programs as Con Edison's. He acted as consultant and advisor on all phases of industrial safety at the conference and will continue in these capacities while on tour.

For the past three years the United States has encouraged the sending of representatives of various governments to the U. S. to study American production methods, an important phase of which was industrial safety. Con Edison has been host to a number of these teams.

Mr. Brown has been safety director of Con Edison since 1944 and has been active in the industrial safety field for 37 years. He received the Arthur Williams Memorial Award from the Amer-

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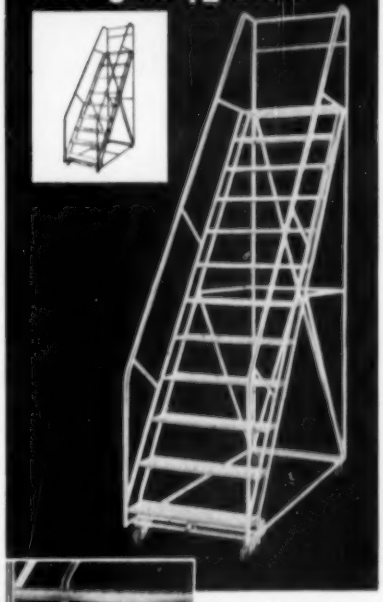
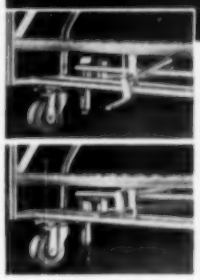
HIGH LEVELS
SAFELY...
ON BALLYMORE
"Hi-boy" SAFETY-STEP LADDERS

FROM 9 TO 12 STEPS





FOOT-OPERATED BALLYLOCK
Step-on brake casters on front of ladder grip floor . . . prevent ladder from rolling, wobbling or "kicking out." When pedal is released, Ballylock quickly retracts by spring action.

Strong, safe, and easily moved about, Ballymore "Hi-boy" Step Ladders provide sure support at extra-high working levels—up to 15 feet!

All-welded steel construction . . . rust-resistant aluminum finish. Smooth-rolling casters provide complete mobility. Rugged step-on Ballylock extends front legs for firm, stable floor contact.

Four sizes, six models to choose from—each with sturdy handrails. Three types of non-slip tread construction.

Write today for complete specifications to Ballymore Company, West Chester 17, Pa.

BALLYMORE LADDERS

THE STANDARD BY WHICH SAFETY LADDERS ARE JUDGED

B & J SAFETY FRICTION WRENCH SPEEDS HOPPER CAR UNLOADING

. . . gives greater protection to employees

The B & J SAFETY FRICTION WRENCH dumps and winds up hopper car doors in less time because it releases instantly and operates with the slightest handle pressure. Its extra long handle gives greater leverage and permits the worker to stand clear of hopper car door.

Its conical head turns inside two straps, so handle cannot spring up and injure worker.

Widely used throughout industry, the B & J Safety Friction Wrench is a superior tool that stands up under rough treatment. Its simple design eliminates constant repairing —no springs, bolts nor ball bearings to cause trouble; no panels or triggers to catch.

Write for further details and prices.

SAFETY FIRST SUPPLY CO.

425 Magee Street • Pittsburgh 19, Pa.

ican Museum of Safety on September 19, 1956.

Mr. Brown is a past president of the American Society of Safety Engineers and has held prominent posts in the National Safety Council, the Greater New York Safety Council and the American Standards Association.

He has also served on the Atomic Energy Commission's Safety and Health Board; accident prevention committees of the Edison Electric Institute and American Gas Association; the President's Conference on Occupational Safety and New York Governor Harriman's Safety Advisory Committee.

DR. IRVING R. TABERSHAW has joined the Nuclear Development Corporation of America, White Plains, N. Y., as director of health and safety.

One of the nation's leading authorities on industrial health and safety, he had been director since 1953 of the division of industrial hygiene, New York State Department of Labor.

Nuclear Development Corporation is the oldest and largest independent company devoted to nuclear research, engineering and development. It has contracted with the U.S. Atomic Energy Commission to build an atomic reactor of original design for a 10,000-kilowatt nuclear power station at Anchorage, Alaska.

Dr. Tabershaw will continue limited consulting in industrial medicine. He is a recognized expert in prevention of beryllium poisoning and in other industrial-health areas.

A native of New York, he also will continue as associate professor of occupational medicine at the Columbia University School of Public Health and Administrative Medicine. He has been a member of the university's faculty since 1946.

He is a graduate of University of Pennsylvania and Long Island College of Medicine. After several years of private practice, he joined the U. S. Public Health

Powdered Soap

Liquid Soap EVERY TYPE OF SKIN CLEANSER **Bar Soap**

Lightfoot

manufactures all three from raw material to finished product!

A Specialized Soap for Every Type of Plant Requirement!

Whether for light, heavy or extra heavy duty, for general plant or office use, or to solve specific cleansing problems, our more than 40 years of experience in serving industry is at your service. *Your inquiries will receive prompt and intelligent attention!*

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Service, serving as a physician in Massachusetts and as director of the division of industrial hygiene in Alabama.

From 1946-51 he was Eastern medical division director of Liberty Mutual Insurance Companies. After two years' private practice of industrial medicine he was appointed director of the division of industrial hygiene of the New York State Department of Health.

Moody Covey has been promoted to safety supervisor of Tidewater Oil Company's seven-state and Hawaii western division. He replaces Samuel O. Bacon of Concord, Calif., recently deceased.

Mr. Covey will be responsible for supervising accident control programs, guidance in eliminating unsafe practices and conditions, recommending protective equipment and accident prevention methods, and participation in accident prevention investigations and analyses. He will make his headquarters in San Francisco.

A graduate of Oklahoma A&M College, Stillwater, Okla., with a BS degree in mathematics and industrial engineering, Mr. Covey joined Tidewater in 1950 as a junior engineer at its former Drumright, Okla., refinery.

Previous to his present appointment, he was divisional safety supervisor for the company's southern division with headquarters in Houston.

"Don't mind Fred—he's always mumbling about something!"

get modern eye protection WITH JONES FULL VISION VISOR GOGGLES

Send for Illustrated Catalogue for Models Listed Below

CLEARVIEW	#1	Clear Lens
GLARESTOPPER	#1A	Light Pale Green
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Choice of 18 hole or Screened Port ventilation

ONE-PIECE SHATTERPROOF PLASTIC LENS
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Safe-Hi
CHISEL GRIPS

a striking improvement in sledging and chiseling
used extensively for
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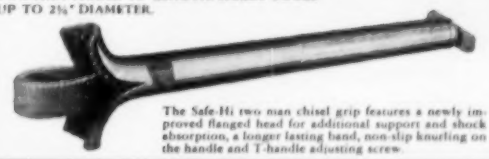
TWO-MAN MODEL 18" LENGTH HOLDS TOOLS UP TO 2⅝" DIAMETER.



The Safe-Hi two man chisel grip features a newly improved flanged head for additional support and shock absorption, a longer lasting band, non-slip knurling on the handle and T-handle adjusting screw.

ONE-MAN MODEL 6" HANDLE HOLDS TOOLS UP TO 1¼" DIAMETER.

The Safe-Hi one man chisel grip is durable and lightweighs only 5 oz. Shock insulated rubber belting band absorbs shock and prevents "creeping" of chisel through grip.

Safe-Hi chisel grips provide new protection against smashed fingers and hands by keeping hands well away from the danger of off-angle hammer and sledging blows. Since Safe-Hi chisel grips hold steel stamp or chisel securely, sledging and chiseling is more accurate and faster. The danger of flying chisels is also eliminated.

Safe-Hi spark-resistant chisel grips also available.

EXCELLENT FOR USE WITH STEEL STAMPS

ROSE MANUFACTURING CO.
2700 W. Roberts Pl
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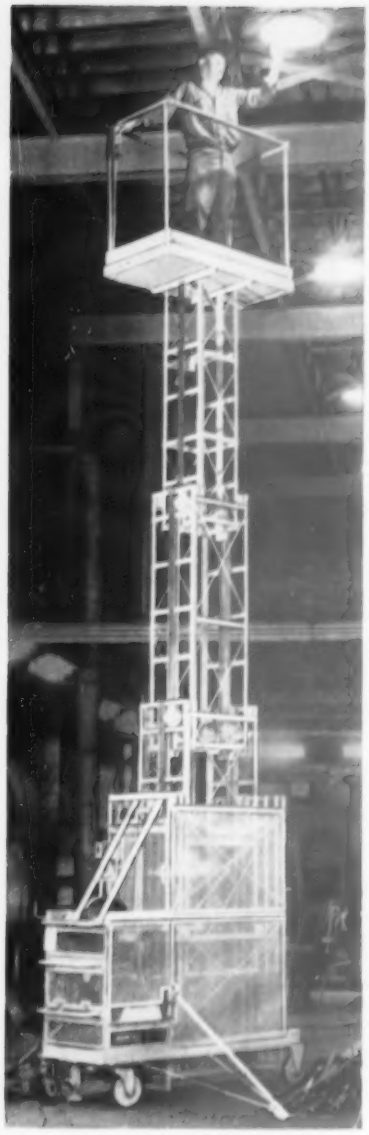
Safe-Hi DENVER



The man who feels safe works better on overhead maintenance

Safety is our first consideration in building Hi-Reach Telescopers.

Model LB (illustrated), push-button control on platform. Four heights 20 ft. to 35 ft. (all models lower to clear doorway 6'-8" by 36"). Priced from $1510.00 up. Model PUL Hand Operated Lift — 15 ft. — $400.00. Custom-built lifters up to 100 ft.

Write for catalogue

Economy Engineering Co., 4516 W. Lake St., Chicago 24, Ill., 342 Madison Ave., New York 17, N. Y.

ECONOMY ENGINEERING

Calendar Contest Winners For December 1956

"She looks like a wreck to me."

That "Safety Saying" won $100 for Mrs. Ben Dibrell, wife of a credit supervisor with the Oklahoma Gas & Electric Co., Ardmore, Okla.

The Safety Saying Contest appears monthly on the back pages of the National Safety Council's Calendar. The theme of December's contest was "Keep Your Mind On The Job."

Participants in the contest were to write, in 10 words or less, what the gal in the car is saying to her boy friend as he drools over the babe on the sidewalk.

Second prize of $50 went to Mrs. T. Wentworth, sister of John Collins, employed in the Law Department of the Port of New York Authority, New York, N.Y. Mrs. Wentworth's line was:

Leer Today—Gone Tomorrow!

Third prize of $25 was awarded to Miss June Marchand, whose brother, George L. Marchand, is a chemist for the U. S. Rubber Co., Bristol, R.I., for her saying:

A lass, a look and alas!

Thirty $5 prizes went to:

Mrs. Marie Armstrong, State Capitol, Topeka, Kan.

Miss Ellen E. Bates, (Individual Member) Birmingham, Ala.

Donald W. Beard, U.S. Rubber Co., Joliet, Ill.

Miss Virginia Bowling, A. B. Dick Co., Chicago.

Miss Barbara J. Berry, Southern California Gas Co., Los Angeles.

Al Boesl, Niagara Mohawk Power Corp., Buffalo, N.Y.

Gerald Burman, Alpha Portland Cement Co., La Salle, Ill.

Nicolas J. Close, National Broadcasting Co., Washington, D.C.

Mrs. Ruth T. Day, U. S. Gypsum Co., Lisbon Falls, Maine.

Steve C. Filut, Milwaukee Road, Milwaukee.

Mrs. Ben Goddard, B. F. Goodrich Co., Kansas City, Kan.

Mrs. Irene E. Goodnight, Phelps Dodge Corp., Morenci, Ariz.

TESTS SHOW YOU'RE SAFER with ACME

***. . . . the Gas Mask that Gives You* MAXIMUM USABLE VISION**

Vision-scope tests made with leading industrial gas masks prove that ACME Full-Vision Gas Masks lead the field in giving the wearer clear, undistorted vision—up, down, and to either side. Along with maximum usable vision, the ACME provides greater comfort, less fogging, minimum breathing resistance and acceptable conversation transmission—all at down-to-earth prices. Write for Bulletin No. 562 on Vision-scope tests and Bulletin No. 541 on gas masks.

ACME PROTECTION GUIDE LISTS 433 GAS HAZARDS AND HOW TO OVERCOME THEM

This practical guide is a *"must"* for industrial hygienists and safety engineers. It lists 433 hazardous gases, mists, fumes, smokes and dusts along with the ACME gas mask equipment to overcome each specific hazard. Write for Bulletin No. 542.

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McDONALD PRODUCTS
Safety Designed...
with comfort in mind!

the
McDonald Rialto Safety Ladder Shoe

makes any ladder
DOUBLY SAFE!

10 suction cups firmly grip smooth, wet and slippery surfaces.

Specially designed steel toe digs into snow, ice, gravel.

The McDonald Rialto Safety Ladder Shoe installs rigidly and permanently on any ladder with three connecting bolts—not merely screws. The greater level contact surface and suction cup foot make the ladder doubly difficult to tip—permit safe operation on surfaces normally inadequate for ladders.

Approved by Underwriters' Laboratories
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Manufacturers & Distributors of Industrial Safety Equipment

Our 25th Year of
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Mrs. Mabel G. Johnson, Dravo Corp., Pittsburgh, Pa.

Miss Marion L. King, (Individual Member), Pittsburgh, Pa.

Russell Kinkle, Westinghouse Electric Corp., Lima, Ohio.

F. A. Landers, National Lead Co., Houston, Tex.

Miss Lois McCarthy, Kraft Foods Co., Pocatello, Idaho.

Mrs. W. R. Mitcham, Sandia Corp., Albuquerque, N.M.

Mrs. Vera D. Pelton, United Air Lines, Seattle, Wash.

J. R. Ross, The American Oil Co., West Haven, Conn.

Ronald P. Rowley, Kaiser Aluminum Co., Spokane, Wash.

Floyd Snyder, Bethlehem Steel Co., Bethlehem, Pa.

Miss Rosemary Teasdale, Sandia Corp., Albuquerque, N.M.

Oliver Thomas, Union R.R., East Pittsburgh, Pa.

Albert Walker, Socony-Mobil Oil Co., Midland, Pa.

Mrs. Mary G. Wallace, TVA, C&M Branch, Chattanooga, Tenn.

Mrs. Elaine M. Zink, Oliver Iron Mining Div., U.S. Steel Corp., Chisholm, Minn.

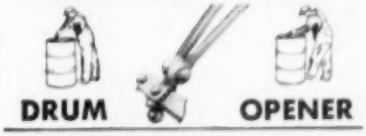
Predict Better Record For "Week-End" Pilots

A SUBSTANTIAL bettering of the private pleasure-flying safety record is predicted by Jerome Lederer, director of the Cornell-Guggenheim Aviation Safety Center. But, he notes, this will be possible only if the private pleasure flyer learns more about basic airmanship.

Although private pleasure flyers had a record of approximately one fatal accident per million miles flown in 1954, in contrast to private business flyers, who averaged only about one fatal accident per 15 million miles, the final accident rate figures for both classes are expected to show substantial improvement for 1955 and 1956.

The Aviation Safety Center pointed out that according to the CAA there were 200 fatal accidents to private pleasure craft in 1954, a number that was reduced to 190 in 1955; however,

YOUR BEST MOVE . . . MOVE *with* **MERRILL** MATERIAL HANDLING DEVICES



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Locks AUTOMATICALLY & instantly-holds

Prevents death and injuries from falling.

Automatic: Positive. Will catch workman if he starts to fall even if unconscious.
Inexpensive. Easy to Install. No upkeep. Clamps to any rung ladders, peg ladders, pole or frame. No welding or cutting.
Simple to operate: Requires no attention from climber.
Notched rail **hot dipped galvanized.** Entire equipment rust and corrosion proof.
Can be kept free of ice by applying heat inside carrier rail.
In use approx. 9 years. Approved by Safety Engineers and Govt. Agcys. throughout country. Patented. Manufactured only by

SAFETY TOWER LADDER CO.
1024 Burbank Blvd., P.O. Box 1052
BURBANK, CALIFORNIA

"VEKI" SAFETY CAP

DESIGNED FOR GREATEST INDUSTRIAL SAFETY

VEKI's larger, roomier, elastic-type snood is designed specifically for enclosing more hair than any conventional type cap . . . full protection for all hair all the time! Front of twill. Back is made of mesh—can also be had in solid or flame-proof materials. Navy blue, and brown. Adjusts to all head sizes. Descriptive literature on request.
Manufacturers and distributors of a complete line of safety clothing and equipment.
Write Dept. NS-2 for information regarding your needs.

V. E. KENNEDY–INGALLS CO.
3735 NORTH 35TH STREET
MILWAUKEE 16, WISCONSIN

private pleasure flyers logged approximately 210 million miles in 1954 against about 222 million miles in 1955.

Thus 1955 saw about a 10 per cent increase in "exposure" (mileage flown) but a 5 per cent decrease in the fatal accident rate. This year, Mr. Lederer said, will in all probability see a still greater increase in the mileage flown by all classes of flyers.

Mr. Lederer attributed the improving safety record of private pleasure flyers to increased concern about the high fatal-accident figures in this group in comparison to business and commercial flyers.

Nevertheless, Mr. Lederer pointed out, the basic problem that confronts the private pleasure flyer today is his own lack of training. Pinpointing this problem led to the formulation of a nationwide educational program under the sponsorship of the Cornell-Guggenheim Aviation Safety Center in cooperation with private flying, manufacturing, government and safety organizations. The purpose of this program is to make private flying the safest form of private transportation there is, Mr. Lederer stated.

The basic cause of fatal accidents in private pleasure flying, said the Center, is the lack of airmanship on the part of private flyers. A great many private pleasure flyers simply do not have the skill or training to handle themselves and their aircraft under adverse conditions. Many do not know how to avoid hazardous conditions or to get out of them when they do arise.

To help remedy this situation, the Center has suggested that private pleasure flyers get training in Link simulators. Another proposal is that flight instruction be improved and standardized throughout the country.

Since most private pleasure craft contain only basic instruments, the Center noted, installation of more flight and navigational instruments and adequate training in their use should materially reduce the accident rate.

In contrast to private pleasure flyers, Mr. Lederer stated that most business flyers have a considerably larger investment in their aircraft and tend to have more thorough instruction in flight procedures. Thus, this class of flyer has rolled up a considerably better record than the so-called "week-end" pilot.

Giant Wire Rope Proofer Checks Quality

FOR NEARLY 50 years, no major improvements had been made in strength of wire rope—one of industry's unheralded products.

Tensile strengths of the most rugged specimens could not exceed 270,000 psi. Recently, this figure has been increased, and previous top standards exceeded by at least 15 per cent.

After several years of research and experimentation, American Chain & Cable Company stepped up tensile strength of its wire rope by introducing the VHS (very high strength) grade.

With introduction of the firm's

Soap and brush action without any brush

Borax scrubber in Prolax powder acts like millions of fine tiny brushes. Makes stubborn grime vanish quickly.

Its hexachlorophene, through regular use, builds an invisible film on the skin that reduces by as much as 95% the resident bacterial population.

Correct for both shop and office; popular with both men and women.

Protect your valued employees from dermatitis with this heavy duty cleanser that is so kind to the skin.

For free sanitary survey of your premises ask your Dolge service man.

Dependable DOLGE
WESTPORT, CONNECTICUT

Dualoc, first mechanical wire rope splice, it became necessary to develop new testing facilities, especially since the Dualoc wire rope ending was developed to utilize ropes of larger diameter. Till recently, both wire rope and wire rope slings were tested in a 250,000-lb. proofloader, inadequate for full testing procedures as rope strengths improved and sling diameters rose.

The situation has been remedied with the installation at ACCO's Wilkes-Barre, Pa., plant of a new universal hydraulic tester of horizontal design. One of private industry's largest machines of its type, the unit has a 600,000-lb. capacity—more than twice that of its forerunner.

It incorporates a long test bed in which specimens more than 60 ft. long can be both prooftested and breaktested. Other units of such capacity, whether in universities or commercial testing laboratories, usually are set up to handle half this length or less.

The unit was designed in conjunction with ACCO engineers and built and installed by Baldwin-Lima-Hamilton Corp., Eddystone, Pa. It is well adapted for determining actual breaking strengths of VHS wire rope products and for proofloading wire rope slings to determine their fitness for specified loads.

Data Sheet

—*From page 46*

health and safety interest of employees exposed to lead hazards. For example, applicable posters should be used on centrally located bulletin boards, and should be changed regularly to maintain interest.

67. Other media for maintaining interest and training employees are:

a. Payroll inserts containing health hints. When paying by check, some companies clip the insert to the check.

b. Sound film strips or moving pictures on industrial health and safety.

c. Company publications.

d. Talks by outside engineers, plant engineer, plant medical officer, or local safety council representatives.

68. It may be thought that too much effort directed toward training employees through meetings, literature, rule books, and other media will focus attention upon an existing occupational disease hazard. This has not proved true in many large companies where hazards were carefully explained and the methods for avoiding them made clear.

ACKNOWLEDGMENT

The content of this data sheet was originally prepared by a special committee of which Harold Ohleheiser was chairman.

A revision draft was reviewed by the Safe Practices Conference Committee and the Health Practices Conference Committee of the National Safety Council.

Liberal use was made of the published material and personal comments of Drs. Robert A. Kehoe, David C. Strauss, Elston L. Belknap, S. F. Meek, Lawrence T. Fairhall, R. R. Sayers, Louis Schwartz, J. C. Aub, Leonard Greenburg, Alice Hamilton, Carey P. McCord, Ludwig Teleky, A. G. Kammer, Milton H. Kronenberg, H. A. Cranston, and others.

GUARD HANDS ON EVERY JOB . . . GET GRANET GLOVES

Give your workers the protection they need in handling chemicals, oils and abrasive materials. Give them GRANET gloves — fully coated or palm coated with neoprene, rubber, or plastic for positive, safe, non-slip grip. Ask your distributor.

GRANET gloves are made for every job, in a complete range of styles. They outwear ordinary gloves yet cost no more. Test GRANET gloves in your plant now, without cost or obligation. State type of use, so that we can provide correct glove.

GRANET

THE GRANET CORP.
19 LORING DRIVE, FRAMINGHAM, MASS.

GETS-A-LITE GUARD and GUIDE

Quickly and Easily Installed by Anyone — No Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
- Made of indestructible spring steel wire. Nothing to break, get out of order or replace. Will last indefinitely.
- Once installed, GETS-A-LITE GUARD AND GUIDE is NEVER removed.
- Nothing to unlock, fuss with or lock, when changing lamps.
- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket, enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

GETS-A-LITE CO. — Dept. NS-27
3365 N. Milwaukee Ave., Chicago 41, Ill.

WHEN YOUR PARKING BRAKES WON'T HOLD

MODEL WB3C

. . . then you can depend on CASTEEL WHEEL BLOCKS to save you from costly hazards when loading at docks or parking on dangerous grades.

Thousands of truckers and fleet owners are using these handy, economical CASTEEL Blocks as part of their safety program.

Made of High-Strength Alloy Steel
Easily Handled and Stored
Round Corners—Ribbed Supports
For All Blocking Requirements

Send for NEW BULLETIN N-57

Calumet Steel Castings Corp.
1636 Summer Street Hammond, Indiana

No more drudgery for me in cleaning grease-caked floors

A flip of the switch re-sharpens brushes automatically!

His boss is happy too . . .

and should be. Now an Industrial Dry-Scrubber, Finnell's 84XR at left, does the job in about one-tenth the man-hour time required to hand-scrape the floors! And of course the machine is far more thorough, and spares maintenance men the back-breaking effort of manual methods. Equipped with two powerful scarifying brushes, the *84XR* digs through and quickly loosens even the most stubborn coatings of dirt, oil, grease, and shavings. Universal couplings enable the brushes to clean recessed areas that rigid coupling brushes would pass over and miss.

Reversible motor keeps wires sharp. *A flip of the switch* reverses the rotation of the brushes and re-sharpens them automatically . . . *while working!* Eliminates the need for frequent changing of brushes by hand in order to maintain a sharp cutting edge. Reversal of brush rotation also helps keep the brushes functioning efficiently by ejecting sticky substances that would otherwise clog and slow up the cleaning process. Total brush spread of the *84XR* is 22 inches. Low, compact design permits cleaning right up to and beneath machinery — areas where deposits are heaviest. Interchangeable rings and brushes adapt the machine to wet-scrubbing, polishing, and steel-wooling.

Brushes adjust to floor irregularities

Clean floors allow industrial trucks to move swiftly, surely and, according to actual tests, with *half the pull* it takes to move loads over dirty floors. In addition, clean floors aid safety underfoot and contribute to worker productivity. So it pays to keep floors clean — especially with a labor-saving *84XR!* (The Vacuum Cleaner at extreme left, *Finnell's 10C*, features a 1½ hp, 115v AC-DC By-Pass Motor. Tank capacity: *Wet*, 12 gallons . . . *Dry*, 1¼ bushels.)

For demonstration, consultation, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 2202 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.

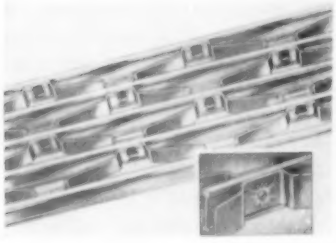
Originators of Power Scrubbing and Polishing Machines

Everything FINNELL for Floor Care

BRANCHES IN ALL PRINCIPAL CITIES

New
SAFETY EQUIPMENT

Product announcements in this section are reviewed for compliance with the advertising policy of the NATIONAL SAFETY NEWS. Inclusion should not, however, be construed as endorsement or approval by the National Safety Council.



Gold Nugget Welded Grating

Gold nugget welded grating is recommended for power houses, loading docks, oil refineries, fire escapes, drain grates, plating rooms, filtration rooms and for all types of heavy duty platforms.

The grating is manufactured by a new vertical welding process, and is a heavy-duty open steel floor grating of greater strength and economy with an anti-skid pattern. The primary load bar provides 22 per cent more strength with 14 per cent less weight and is a miniature I-beam with the advantages of a true structural member. The gold nugget grating features a ⅜-inch projection weld nugget for greater rigidity and strength; a vertical alignment of the main load bars; and all load bars are carrying bars.

The gold nugget grating is an addition to the present Safety Grip-Strut grating.

The Globe Co., 4000 S. Princeton Ave., Chicago 9, Ill. (Item 1)

Groove Joint Pliers

These multi use pliers are forged from high-strength beryllium copper. Five grooves provide non-slip gripping protection. The pliers are non-magnetic, spark-resistant, and corrosion-resistant to most acids. They can double as an adjustable wrench, a pipe wrench, a series of open end wrenches and can replace several sizes of ordinary slip joint pliers.

They are available in two sizes, the 6½-in. size providing parallel jaw openings from 0-1 in. and the 9½-in. size providing openings from 0-1⅜ in.

They are useful tools for electronics work, and maintenance operations where dusts, gases, chemicals, and solids of a flammable nature exist.

Safety Tool Div., The Beryllium Corp., Reading, Pa. (Item 2)

Chemical Eyeshield

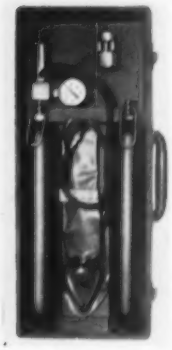
The "Airflow Chem" is a combination of a vinyl hood 11¾ in. long, with 78 staggered ventilating baffles. This gives the eyeshield more than twice the ventilation normally possible with the old style round hooded vents. Splashes, dust and other foreign particles are "screened out" by a wrap-around integrally molded stainless steel 20 mesh screen. This screen ventilation permits air to flow freely to eliminate hazardous fogging.

The eyeshield weighs three oz., and the frame is of soft, flexible vinyl with rolled edges that mold to the natural contours of the face. The soft vinyl integral nose pad is flared for a more comfortable snug fit.

Full vision downward to the normal work level is possible by a design which tilts the lens in toward the cheekbones. The hood offers resistance to chemicals and is available in two colors, yellow and crystal clear. The yellow frame conforms to the American Standards Association color code for acid operations and the crystal clear permits more side vision. The special formula optical plastic lenses are replaceable without tools and federal specifications are met for optical quality as well as impact and piercing resistance.

U. S. Safety Service Co., 1215 McGee St., Kansas City 6, Mo. (Item 3)

For More Information—Circle Item Number on Reader Service Postcard



Portable Oxygen Inhalator

This portable oxygen inhalator kit, light and compact, contains complete equipment for the safe, effective administration of oxygen. The kit includes two cylinders containing a half hour's supply of oxygen. The apparatus is light enough that is can be used on the patient while he is being carried on a stretcher or in an ambulance.

Included in the kit are a plastic facepiece and breathing bag; oxygen diluter; four ft. of hose; a cylinder adapter that permits the small cylinders to be refilled from a large commercial cylinder, and also allows the attachment of the inhalator directly to a large cylinder; two cylinders of oxygen, and a pressure regulator approved by UL Laboratories and U. S. Testing Laboratory.

It has been designed for simple operation. With the regulator pre-set for normal breathing, it is necessary only to turn on the cylinder valve to begin oxygen therapy. The rate of flow can be adjusted to the patient's breathing.

Davis Emergency Equipment Co., Inc., 45 Halleck St., Newark 4, N. J. (Item 4)

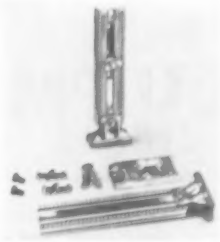
Jumbo Dunking Station

The new jumbo size dunking station is designed to reduce cleanup time in plants where the stations receive more than average use by "on-the-job smokers."

The canister is constructed of heavy cast aluminum with a reinforced "fill level" bottom and approximately twice the capacity of the standard size container.

The jumbo stations are made in three models. Unit No. 1J (weight 26 lbs.) is an upright floor type unit with a heavy weighted base, sign and a jumbo canister. Unit No. 2J (weight 6 lbs.) is designed for mounting on walls, posts, columns or machines and consists of the jumbo canister and sign. Unit No. 3J is the jumbo canister alone with a mounting bracket.

Standard Industrial Products Co., 920 N. Garfield Ave., Peoria, Ill. (Item 5)



Ladder-Leveling Safety Leg

Straight or extension ladders may now be made safer on uneven ground by use of this ladder leveling safety leg. This safety device is for maintenance men, painters, builders, etc., and can be used on either metal or wood ladders. The special Geon covering on the swivel leg is dielectric and acts as a nonconductor.

Easily installed, the extension is made of durable, high-grade steel, capable of supporting heavy loads. It is secured so the Geon-grip, non-slip swivel leg is flush with the base of the ladder, and it adjusts automatically from its normal position to six inches for use on uneven ground.

Rolas Products Corp., 156 Avon Ave., Newark 8, N. J. (Item 6)

Nylon Cord Neoprene Soles

The addition of nylon cord to these new neoprene industrial safety soles and heels adds strength and toughness. The new neoprene compound along with the nylon cord results in a high abrasive index. The soles can take hard, heavy punishment and resist oil, grease and acids.

They are molded in a new, modern sole contour to accommodate stitched around heel seats. The slip-resistant Hi-bloc pattern has been designed to give maximum wear and slip resistance. They are available with matching nylon cord neoprene heels.

American Biltrite Rubber Co., Chelsea 50, Mass. (Item 7)

Dust Respirator

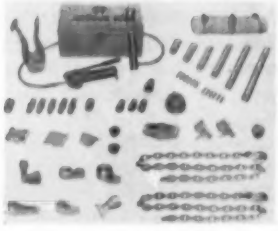
The U. S. Bureau of Mines has approved this respirator for protection against dusts, pneumoconiosis-producing mists, and chromic acid mist.

The "MonoMask" is integrally molded of resilient, natural rubber. The one-piece construction and the smooth contour of the facepiece make it easier to clean than the multiple-section respirators. It uses a single filter of treated felt which, it is claimed, offers higher filtering efficiency and longer life than other filters. The filter is held in position by means of a nylon retainer which requires no clips or fasteners.

The mask has no metal parts and no exposed plastic parts. The head band is attached to the front of the facepiece to provide a reverse-lever action for a firmer, safer fit against the face. Positive-action inlet and outlet valves insure uninterrupted ease of breathing.

The mask provides a close fit when the respirator is worn with spectacles or goggles.

Willson Products Div., Ray-O-Vac Co., Reading, Pa. (Item 8)



Hydraulic Powered Rescue Kit

The P-F hydraulic rescue kit does a quick and efficient job of freeing victims trapped by accidents. The portable kit combines necessary equipment for quick action and comes in a metal case. It includes a canvas case for easy carrying over ladders or underground. It is independent of outside power sources and can be safely used near gasoline, gas or other explosive fumes.

It applies 7½ tons of power through the remote-control, self-retracting hydraulic jack, which is equipped with a 7-ft. hose, enabling the operator to work at a safe distance when necessary.

In addition to the jack the kit contains many features which add to its speed and efficiency such as the spreader which fits into tight places and gives an over-all spread of 16 in.; the hydraulic ram which pinpoints the 7½-ton pressure; the chain pull kit which is quickly and easily assembled for fast pulling operations; the non-skid pushing bases; and other attachments which make it possible for the kit to push, pull, lift, press, and spread in any position.

H. K. Porter, Inc., Somerville 43, Mass. (Item 9)

Magnetic Decontamination

The "Roto-Grate" separates accidental iron fines from finished zinc oxide. Metal passes from the screw conveyor, through the "Roto-Grate" and into the elevator.

The separator is powered by magnetic tubes of Alnico V, and the non-electric grate revolves slowly through the passing flow of material, preventing clogging or bridging, and breaking up particles that tend to cling together and picking out any stray iron fines which become firmly secured to the tubes.

Eriez Mfg. Co., Erie, Pa. (Item 10)

Protective Clothing

Special nylon protective clothing impregnated on both sides with a resin compound, is lightweight. Calendering of the fabric assures a good bond that defies peeling and provides longer wear and flexibility. The new material offers protection against water, acids, caustics, chemicals, oil, grease, adhesives, etc., and industrial dermatitis.

Abrasion resistance is high and the fabric is difficult to tear. The clothing is made from the resin impregnated nylon and is suitable for use in industrial plants, chemical plants, refineries and in the construction and mining industries. It is available in a complete range of styles, including aprons, coats, jumper suits, jackets, pants, helmets, leggings, sleeves and spats.

Safety Clothing & Equipment Co., 1990 East 69th St., Cleveland 3, Ohio (Item 11)

Crane Warning Device

This electro alarm functions as a warning device of high-line proximity to crane operators and workmen from distances of 8 in. up to 400 ft. from lines, depending upon the voltage in the line and the setting of sensitivity controls by the operator. It functions on ac. or dc. voltages, active telephone lines, streetcar lines, and some shallow buried underground cables.

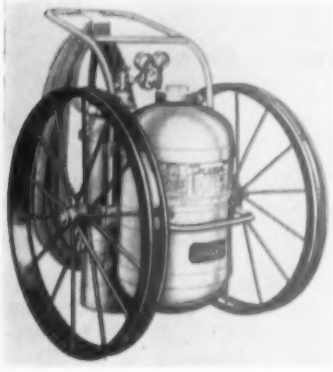
A special circuit allows the device not to depend upon actual current being drawn through the lines to set off the alarm. Voltage presence is all that is necessary to cause the device to function at a safe distance.

The device uses a heavy duty-horn for the alarm and can be adjusted for tone. It is equipped with automatic fail-safe circuits, which protect personnel from relying on the device if a defect appears. A defect causes a red light to flash on the front panel and it continues to flash until the defect is repaired or the device is shut off. If the boom cables are left unplugged the horn will also sound at the same time the red light flashes. This safety feature will show such defects as unplugged boom cables, burned out tubes in boom boxes and master units, defective parts, shorts, blown fuses, low battery voltage, defective horn, etc.

The device has a life expectancy of about six years and functions on any rig, regardless of make, model or size.

It will operate at night, and in rain or ice.

Electro-Alarm Safety Devices, 745 Pleasant St., Fresno 5, Calif. (Item 12)



Dry Chemical Engines

Seventy-five and 150-lb. dry chemical engines are high-capacity, mobile extinguisher units for combating class "B" fires. The new models provide an effective means of killing big flammable-liquid blazes.

They are intended for use in oil refineries, volatile liquid storage depots, paint and varnish manufacturing units, etc. They are compact, maneuverable, and simple to operate and maintain.

Both models are UL and Factory Mutual Laboratories approved, and the engines utilize pressured nitrogen to expel the dry chemical powder through an adjustable nozzle which can be set for long-range or "fan" stream. The 150-lb. model gives approved protection for 80 sq. ft. of flammable-liquid hazards such as open dip tanks, quench tanks and solvent vats.

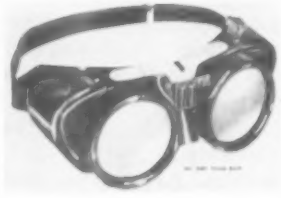
Fyr-Fyter Co., Dayton, Ohio. (Item 13)

Neoprene Waterproof Clothing

This neoprene-nylon, yellow, waterproof clothing for linemen is available in five models. The jackets, pants, hoods and overalls are made of neoprene coated nylon cloth. The suits are very light weight and will withstand temperature extremes up to 125 F. and down to —30 F. without becoming soft or tacky and stiff or brittle. They will not mildew or crack if neglected in a closed container over long periods.

The nylon suits are acid and oil resistant and are available in bright yellow or sea green.

John E. Dorsey Co., 570 E. First St., Boston 27, Mass. (Item 14)



"Jumbo" Welding Goggles

Two different styles are available in these jumbo-size welding goggles. They are large enough to be worn easily and comfortably over the welder's personal glasses.

The principal difference between the two goggles styles is in the nose bridge; one pair has an adjustable bridge for extra close fit, while the other (Model 620-Rigid Bar, illustrated) has a ridge brace bar joining both eye cups so the wearer can raise the goggle with one hand.

The eye cups of the new goggles are thermosetting plastic and are claimed to have good ventilation around the eye cups. A choice of lenses is permitted with the glass meeting all commercial or federal specifications for safety and vision.

Sellstrom Mfg. Co., Palatine, Ill. (Item 15)

Aluminum Alloy Castings Remover

The "Spruemaster" is a new tool for removing castings from die casting machines and is made of high tensile aluminum alloy. The light weight tool reduces operator fatigue and increases efficiency. Made in various lengths, it is designed so that the cone-shaped head will fit a wide range of sizes.

A hardened steel plunger actuated by a lever on the handle grips the sprue securely with a minimum of leverage applied by the operator. By relaxing the pressure, the lever instantly releases the tool from the casting. The tool cannot be operated without grasping the lever at the handle, so the operator is kept clear of the dies at all times. This reduces the danger of burning or crushing hands or fingers.

The "Spruemaster" is available with a 10- or 15-in. shaft for either right or left hand feed and all parts are interchangeable and easy to replace.

Osborn Mfg. Corp., Warsaw, Ind. (Item 16)

Remote Consumable Furnace Viewer

This viewer permits safe, maximum observation, through optical means, of the travel of the electrode during the process of ingot production in consumable arc furnaces.

The viewer fits over the viewing port of the furnace so that the operator can stand safely outside a concrete barrier and study the image of the electrode on an 8-in. ground glass screen through a safety glass window. The electrode can be followed visually from about 1 ft. downwards to a maximum of 10 ft. The image size varies from 1.5 in. at a 2 ft. working distance to approximately 6 in. at 4 or 5 ft., since magnification of the image changes with respect to the distance between the image and object.

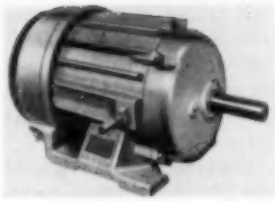
American Optical Co., Instrument Div., Buffalo 15, N. Y. (Item 17)

Floor Repair Compound

Jiffy Floor is specially formulated to quickly repair expansion joints, floor cracks and other surface defects. A fine granular, ready-to-use plastic product, Jiffy Floor fills hairline cracks, shallow holes or spalled floors. It can be applied without disrupting production or traffic and withstands heavy loads immediately after application. It contains no asphalt, cement, sand or gravel and it will not crack, crumble or curl and can be applied either indoors or out as it is not affected by temperature changes.

Jiffy Floor is said to be waterproof, dustless, skidproof and noiseless. It is delivered 5- 10- 30- and 55-gal. drums, ready to use.

The Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio. (Item 18)



Self-Cleaning Textile Motors

The Clean-Flo motor is an enclosed, fan-cooled, self-cleaning textile motor. The cooling air, driven by the high velocity motor ventilating fan keeps the motor free of lint. The totally enclosed construction prevents lint from entering the interior of the motor, which is an important safety feature as it reduces fire hazards in textile mills and prevents motor burnouts due to the collection of lint.

The motors are built to meet standard NEMA dimensions and the versatile mounting permits the motors to be built with the shaft brought out through the fan end as an alternate construction. This allows the motor to be mounted in the aisle, but directs the air flow away from the driven machines.

The self-cleaning design is accomplished by departure from conventional motor construction. One end bracket and the housing are combined to provide a single, streamlined, lint-free enclosure. The housing is cast from the fan end to eliminate the possibility of pattern shift appearing at the center of the housing, thus avoiding a lint collection obstruction. The shaft extension end bracket is a smooth casting and the cooling ribs on the housing have been contoured in the direction of the air flow for maximum smoothness. There are no flat surfaces to break the contour and collect lint.

Louis Allis Co., Milwaukee, Wis. (Item 19)

Light Duty Budget-Swing Stage

A low-cost, light-duty swing stage offers time-saving convenience and three-way fall prevention. The stage can be raised or lowered at speeds of 20 fpm.

The Safway "Budget Swing" is practical for a wide range of light-duty work performed above ground level.

An 8-in. wide material platform is conveniently located at hip level. The equipment comprises two winches with removable stirrup and guard rail attachments.

The budget swing has been tested and approved by Underwriters' Laboratories and meets all recognized safety standards. The working capacity including a safety factor of 4 to 1 is 700 lbs. Each winch is provided with 75 ft. of ¼-in. 6x19 galvanized improved plow steel wire rope.

In addition to the safety provided by the guard rail, toe board and material platform, three automatic protective devices are incorporated in the winch to prevent falling. First, a mechanical brake is built into the direct-drive gear mechanism. Second, a spring-loaded pawl positively engages the winch drum with the stirrup. Finally, a handle-stop makes it impossible for the handle to reverse inadvertently.

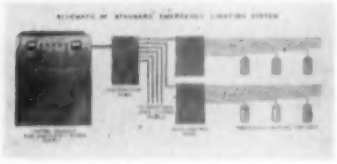
Safeway Steel Products, Inc., 6234 W. State St., Milwaukee 13, Wis. (Item 20)

Fire Suit

An aluminized asbestos fire suit with a respirator was recently demonstrated on a mock airplane fuselage fire. While the flames were at their height, four men, wearing the "Fire King" aluminized asbestos suits and respirators controlled the fire. Two of the men carried foam nozzles and two went directly into the airplane to "rescue" a dummy. After clearing the area, the flames were extinguished.

The suit consists of an aluminized asbestos garment under which an air type (not oxygen) respirator is worn. The suit will allow a man to enter intense heat conditions for short periods of time, in many cases enabling fire fighters to prevent death from burning.

Wheeler Protective Apparel, Inc., 224 W. Huron St., Chicago, Ill. (Item 21)



Emergency Lighting System

A new centralized emergency lighting system that constantly supervises itself has been approved by Underwriters' Laboratories and exceeds the requirements of the National Electrical Code.

The system not only reports, by flashing lights and buzzers, any fault to the system but sounds an alarm when an emergency lamp is removed from its socket. This built-in supervision makes the system foolproof and gives assurance that emergency lights will go on whenever regular power fails. Emergency lights go off when power is restored. The 32-volt battery is automatically recharged and kept at full capacity by a constant trickle of charging current.

The unit uses a long life nickel-cadmium battery that uses an alkaline electrolyte that does not corrode or give off obnoxious fumes.

The system has been especially designed for hospitals, schools, office and industrial buildings.

Standard Electric Time Co., Springfield 2, Mass. (Item 22)

Single Eye-Piece Safety Goggle

The single eye-piece "Solo Goggle" improves the view of work with its "picture window" and offers safety and comfort to the worker.

It uses 2x4¼-in. filter lenses and cover glass and fits over the largest, latest types of safety or personal prescription glasses. The lenses are easily replaceable and no tools are required.

The "Solo Goggle" is available with a head rest for pressureless close-to-face fit or for ventilated off-the-face wear. The single, center-linkage has an easy friction adjustment. The sweatband-fitted headband has wide range head adjustment to fit any size head.

It is available with an adjustable elastic headband.

Fibre-Metal Products Co., Chester, Pa. (Item 23)

Explosion-Proof Floor Machine

Safe maintenance of floors in powder factories, atomic research plants, oil refineries and other hazardous industrial areas is the purpose of this explosion-proof, all-purpose floor machine.

Wiring from the motor to the handle is eliminated by mounting the electric switch on the motor housing. The start-and-stop control is on the handle. The entire unit is constructed, safety-tested and sealed to prevent sparks and static that might ignite explosive gas, dust, fumes or vapors. The static eliminator wire in the brush prevents shock to the operator.

Dual handles spread the load, eliminate the effects of torque and give the operator better control. The machines have 16- and 20-in. brushes.

Holt Mfg. Co., 669 - 20th St., Oakland 12, Calif. (Item 24)

NEWS ITEMS

This year marks the 50th anniversary of the Hillyard Chemical Co., manufacturers of floor treatments and floor maintenance products.

HILLYARD CHEMICAL CO.

The firm's new six-story office building in St. Joseph, Mo., will be dedicated during the 50th anniversary celebration. The completely remodeled and ultra-modern office facilities will contain the executive offices of the three Hillyard companies and foreign trade offices.

The Hillyard Co. has plants in Passaic, N. J., and San Jose, Calif., with branches and warehouse stocks located in principal cities throughout the United States.

* * *

J. R. "Joe" Thompson has joined the sales staff of the Fibre-Metal Products Co. His territory will cover the North Central West from North Dakota to Indiana and includes Iowa and Nebraska. Mr. Thompson will work with welding and safety supply houses on Fibre-Metal welding helmets and safety face and head protective equipment.

* * *

Personnel of the newly organized Industrial Division of the Wilson Rubber Co., Canton, Ohio, are shown in this group picture taken at the first sales conference.

WILSON RUBBER CO.

The company is expanding its various manufacturing and marketing operations. In 1954 the company became a division of Becton, Dickinson and Co. of Rutherford, N. J.

E. Jack Barns is director of sales.

* * *

J. H. Humberstone, president of Air Reduction Sales Co., a division of Air Reduction Co., Inc., announced the company's acquisition of the assets and business of Jackson Products, Inc., of Detroit.

The Jackson Products Co. manufactures welding electrode holders, welding helmets, safety goggles, and other welding supplies.

The present distribution channels will be maintained by Air Reduction Sales Co.

Promotion of L. Thomas Plouff, former manager of sales analysis and control, to the export sales manager for Ansul Chemical Co. of Marinette, Wis., was announced.

Mr. Plouff joined Ansul in 1939.

* * *

Shown here are the 1956 winners of the Jomac, Inc., sales contest.

JOMAC, INC.

The Philadelphia manufacturer of work gloves, laundry cloth, etc., had a higher sales volume during the last 12 months than during any similar period in its history.

* * *

J. A. CASEY

The Granet Corp. of Framingham, Mass., has announced the appointment of J. A. Casey as sales manager. Mr. Casey was formerly associated with the Edmont Manufacturing Co., of Coshockton, Ohio.

The Granet Corp. is a manufacturer of latex and plastic products.

* * *

ARTHUR STAHMAN

The election of Arthur Stahman as president of the Silicone Paper Co. of America, Inc., has been announced by Henry J. Taylor, chairman of the board. Mr. Stahman had been vice-president since 1949 and has been associated with Mr. Taylor's business for 28 years. The company is a producer of silicone-treated paper, with plants at Rochester, N. Y., Cleveland, Ohio, and Lee, Mass.

TRADE PUBLICATIONS

These trade publications will keep you up-to-the-minute on new developments in safety equipment and health products. All catalogs are free, and will be sent without obligation. Just circle publication number on the Reader Service Postcard.

1. "Scaffolds and Ladders": Scaffolds and ladders for construction, concrete shoring, plant maintenance and building repairs are explained and illustrated in this new 32-page catalog "A." Erection procedure, technical data, uses and typical installations are given for each of the many types of built-up, suspended and swinging scaffolds. Wood, aluminum and magnesium ladders, as well as aluminum scaffolds are included. Patent Scaffolding Co., Inc., 38-21 Twelfth St., Long Island City 1, N. Y.

2. Eye Protector: This two-page, three-color bulletin, describes company's new "Solo goggle," a single unit "picture window" goggle for full view and maximum protection for the eyes in brazing, cutting, gas welding, grinding and similar work. The Solo goggle is available with an adjustable elastic headband or with a headrest support with a positive single point friction joint (which may also be used with safety caps). Fibre-Metal Products Co., Chester, Pa.

3. Wall Chart: A wall chart to be used as a guide in the proper use of alloy chains and alloy slings has been made available by manufacturer. The 22″ x 28″ chart features a table giving the working load of single, double, triple and quad branch slings — sizes ¼″ to 2″ — when used at 90°, 60°, 45°, 30° and 10° angles with the load. In addition, the chart provides definitions, instructions, and cautions governing the purchase and use of chain as well as data on inspection, wear, and the use of chain under heat conditions. S. G. Taylor Chain Co., Inc., Hammond, Ind.

4. "Prescribed Lighting Protects the Eyes of Industry": This 28-page booklet features sections on safety and visibility factors, standards for use in prescribing plant lighting, uses of fluorescent, incandescent and mercury vapor lamps; lighting of other areas, maintenance, and condensed catalog data on fixtures. Sylvania Electric Products, Inc., One 48th St., P. O. Box 831, Wheeling, W. Va.

5. "Methylene Chloride, the Better Multipurpose Solvent": This 3-color, 24-page booklet gives complete technical information on methylene chloride. The booklet shows the advantages the chemical offers for use as an aerosol pressure depressant, vapor degreasing solvent, cold cleaning solvent, extraction solvent and secondary refrigerant. The Dow Chemical Co., Midland, Mich.

6. Linemen's Tools: Catalog No. 100 features pliers and electricians' and linemen's tools and equipment. Included is a new feature that will be of special interest to plier users. Dimensions of each part of every plier—length of handles, of cutting knives, of nose, width of head, point, etc. — are given in detail. Mathias Klein & Sons, 7200 McCormick Road, Chicago 45, Ill.

7. "Acid and Caustic Resistant Industrial Apparel": Featured in this 15-page catalog are work clothes made of 100 per cent du Pont Orlon and 100 per cent Union Carbide Dynel. Illustrated are work pants, shirts, laboratory coats, coveralls, gloves, etc. Laboratory reports on the technical properties of du Pont Orlon Acrylic fiber included. Workton, Inc., 253 W. 28th St., New York 1, N. Y.

8. "How to Operate a Lift Truck": This informative 24-page, 2-color booklet is offered without charge by Hyster Company to lift truck supervisors, operators, safety engineers and other interested industrial and governmental personnel. The booklet is designed for easy reading and is packed with information about the operation of a lift truck, preventive maintenance, safety and basic materials handling. Drawings for setting up an obstacle course are also included. Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.

9. Thompson Hangers and Accessories: A new, illustrated, 8-page booklet TH-56, covers the company's line of Thompson Hangers and accessories for indoor applications. Featuring a patented mechanism, Thompson Hangers permit a maintenance man to lower inaccessible overhead lights to floor level for servicing and then return them to operating position. All operations are accomplished quickly and easily without any climbing or electrical hazards. Typical installations in high-bay buildings ranging from industrial plants to aircraft hangars illustrated. Underwriters Laboratories ratings and general specifications for 2-pole and 4-pole hanger models, shock absorbers, pulleys, beam clamps, suspension and terminal fittings, and hanger operating chain and cable are included in this booklet. The Thompson Electric Co., 1199 Power Ave., Cleveland 14, Ohio.

10. Welding Electrodes and Accessories: Bulletin RW-10 describes company's complete line of Ampco-Weld Resistance welding electrodes and accessories. Included in the 28-page, two-color catalog are applications, specifications and dimensions of standard welding tips, wheels, dies and holders. Also offered is descriptive and highly illustrative data on holder-to-tip adapters, quick dis-connect shutoff couplings, seam welder shafts and bushings. Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 46, Wis.

11. Blast Room: Vacu-Blast Room, for low cost cleaning of castings with high visibility, achieved through efficient downdraft ventilation, is described in this leaflet. A patented

waffle-type floor permits rapid removal of abrasive from the room. The abrasive is removed from the blast room by the air that ventilates the room, is completely air washed and is returned to the continuous blast generator in a closed system. The blast room is designed for simple installation, and it can be easily moved. No excavating for a pit at the new location or filling a pit at the old location is required. Vacu-Blast Co., Inc., Belmont, Calif.

12. "How to Perform Dye Penetrant Inspections": This 4-page folder thoroughly discusses every aspect of penetrant flaw location—pre-cleaning, applying penetrant, removing excess penetrant, applying developer and interpreting results. Special emphasis is placed on the pre-cleaning steps, and methods of removing all types of soil are thoroughly outlined. In addition, the booklet contains a valuable "dwell time" chart, which details recommended penetrating times for various types of materials and various types of suspected defects at various temperatures. The booklet is designed to serve two primary purposes—to acquaint new inspection personnel with the most efficient procedures for performing penetrant inspections, and to re-acquaint qualified inspection personnel with the necessary precautions that must be observed during penetrant inspections.—Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

13. Daylight Fluorescent Paints: 4-page, 3-color brochure describes daylight fluorescent paints for use on all types of advertising displays, direction signs, visual training aids and department identification. Safety conscious plants finds scores of uses, such as highlighting fire extinguishers and first aid boxes; painting glowing arrows to fire escapes; outlining control boxes; marking dangerous equipment and stripping obstructions. Lawter Chemicals, Inc., 3550 Touhy Ave., Chicago, Ill.

14. Hand Hoist, Pul-Lift and Trolley Catalog: A new catalog covering the features and specifications of company's line of hand hoists, Pul-Lifts and plain and geared hand hoist trolleys is available. A 44-page booklet, this addition to the Yale Materials Handling literature contains in addition to product information an article entitled "How to Select the Proper Type of Hoisting Equipment." Featured are lightweight Load King Hand hoists, Yale spur-geared hoists in their many varieties, the Pul-Lift ratchet hoist and trolleys in capacities from ½ ton to 40 tons. The Yale & Towne Manufacturing Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

15. "Dow Corning Silicone Products": The new 1957 Reference Guide to Dow Corning Silicones has just been published. Almost 150 commercially available silicone products are described in this year's catalog, including several which were developed within this last year. The products are grouped by usage (water-repellents, dielectrics, release agents, etc.), enabling engineers to locate a material by what it does as well as by what it is. Descriptions are brief and factual, with emphasis on charts, tables and graphs directly comparing various silicones with the materials they are displacing. Dow Corning Corp., Midland, Mich.

16. Emergency Lighting: Catalog illustrates and describes the Standard Emergency Lighting System designed to provide emergency illumination throughout public and private buildings, from a central power and control council during periods when normal electric service is interrupted. The system uses separate lamp fixtures and all emergency lighting circuits are independent of the building's regular lighting circuit. The system is completely automatic in both operation and recovery and is under constant electrical supervision to warn of any disarrangement, including the condition of individual lamps. The lighting system is listed by Underwriters Laboratories. Standard Electric Time Co., Springfield 2, Mass.

17. Safety Marking Tools: Marking tools for steel plant applications are featured in this new folder. Among the products included are billet marker, tag embossing and tagging outfit, billet mill cut letter stamps, steel stamps and type, and type holders. M. E. Cunningham Co., 1053 Chateau St., Pittsburgh 33, Pa.

18. Safety and Accident Prevention Signs: Catalog illustrates and describes company's complete line of Ready-Made Signs for Safety. Complete specifications included. Ready Made Sign Co., Inc., 115 Worth St., New York 13, N. Y.

19. "The Control of Dermatitis in Industry": This 24-page booklet emphasizes preventive measures in a range of industries. A large chart lists the various working conditions, types of dermatitis prevalent under these conditions and suggested preventive measures. West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y.

20. Welded Grating: 8-page, 2-color catalog describes a heavy duty grating for use in power houses, loading docks, oil refineries, fire escapes, drain grates, plating rooms, and all types of heavy duty platforms. The catalog shows the various styles available, gives recommended uses. The Globe Co., 4000 S. Princeton Ave., Chicago 9, Ill.

21. Face Protection: Catalog describes seven different styles of head gear and window selections. Featured is the new Buco face shields that offer greater safety with "contour-fit" for wearer comfort. Joseph Buegeleisen Co., 21220 W. Eight Mile Road, Detroit 19, Mich.

22. Plant Protection: Folder describes the Guardsman Watchclock System, a tape-recording watchclock that keeps your watchman alert on weekends and holidays as well as on weekdays. The Guardsman is tamper-proof. It discourages the temptation to skip rounds or shirk duty. Detex Watchclock Corp., 76 Varick St., New York 13, N. Y.

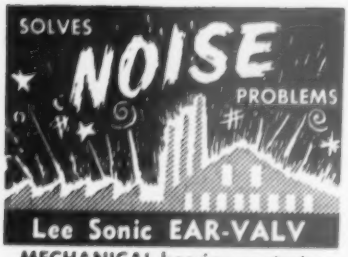
23. Rotary Hand Pumps: Application of rotary hand pumps to transferring liquids on many different types of jobs is discussed in this bulletin. Blackmar Pump Co., Grand Rapids 9, Mich.

24. Safety Solvents: Complete product information on safety solvents, solvent still, and solvent vapor degreasers described in this literature available from manufacturer. Tect, Inc., Dumont, N. J.

25. Coated Work Gloves: Four types of coated work gloves, including neoprene, plastic and rubber, are detailed in this 16-page illustrated catalog. Of special interest is a performance in chemical resistance preference chart for the various glove models available. Edmont Manufacturing Co., 1300 Walnut St., Coshocton, Ohio.

26. Safety Mirrors for Industrial Use: Safety mirrors designed for use in factories and warehouses where blind corners, cross-aisle intersections, entrances and exits present a safety problem because of traffic accidents are described in this bulletin. Lester L. Brossard Co., 540 N. Michigan Ave., Chicago 11, Ill.

27. Hand Dryer: Illustrated folder describes and illustrates an electric hand dryer for washrooms. Among advantages listed are rapid drying, no maintenance and cost saving. Specifications are listed and adjustable nozzle for face-drying is illustrated. Chicago Hardware Foundry Co., 1030 Commonwealth Ave., North Chicago, Ill.



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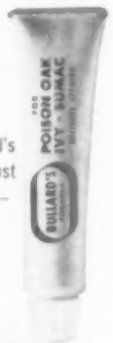

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New Safety Equipment

Products featured in this section have been carefully reviewed by Council engineers so as to bring you only what's new and reliable in the safety field. Only new safety and health products, or newsworthy improvements in existing equipment are eligible for listing.

Trade Publications

Here's a wealth of helpful trade literature—catalogs, spec sheets, booklets, brochures—that will help you compare before you buy. Whether you are in the market now, or think you may be at a later date, you'll want these valuable references in your safety equipment data file.

Products Advertised

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63B	64	85	86	87	88	89	90	91	92	93	94	
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109B	110L	110R	111T	111B	112T	112B	113T	113B	114T	114B	116T	
116B	116T	116B	120	121L	121R	122T	122B	123T	123B	124L	124R	
125L	125R	125L	125R	127T	127B	128L	128R	129L	129R	130LT	130LB	
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63B	64	85	86	87	88	89	90	91	92	93	94	
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109B	110L	110R	111T	111B	112T	112B	113T	113B	114T	114B	116T	
116B	116T	116B	120	121L	121R	122T	122B	123T	123B	124L	124R	
125L	125R	125L	125R	127T	127B	128L	128R	129L	129R	130LT	130LB	
130RB	131LB	131RT	131RB	132	142LT	142LB	142RB	IBC	BC			

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The advertising policy of the NEWS requires that all equipment and products meet established codes and standards, have the approval of recognized testing agencies, or have proven their value through actual use in industry. Council engineers and technicians screen every advertisement to make sure that product description is accurate, and performance claims verified by reliable sources. It should not be construed, however, that products advertised are approved or endorsed by the National Safety Council.

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4. The F9500 acetate Series is available with metal screen side shields. The F5100 metal series is available with all plastic perforated side shields.
5. Both series are available with 6 curve Plastolite (plastic) lenses.
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